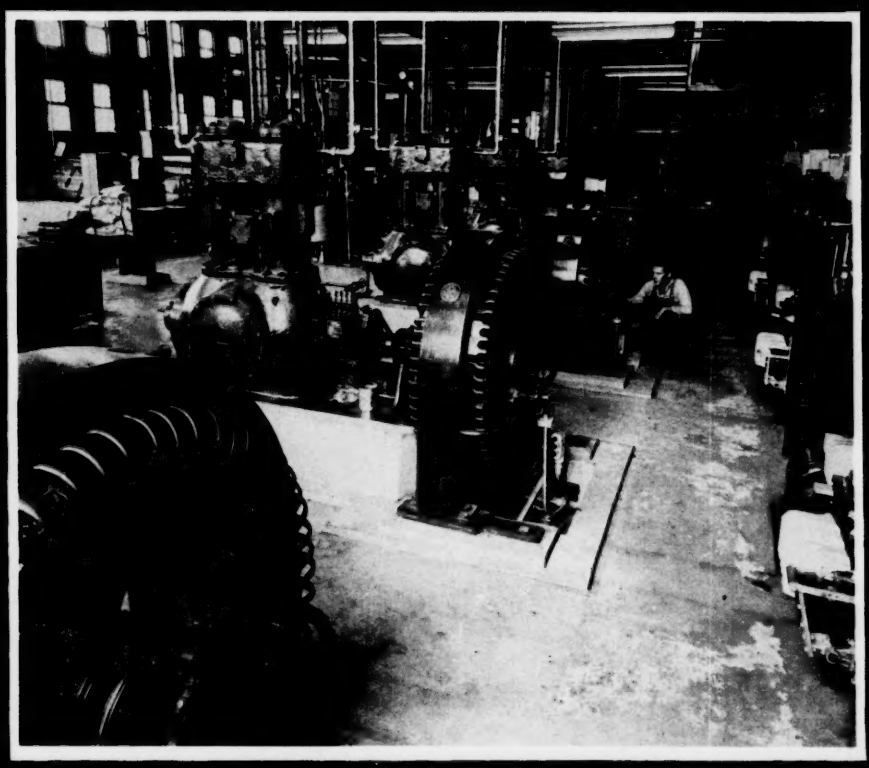
ICE and REFRIGERATION



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NOVEMBER • 1950

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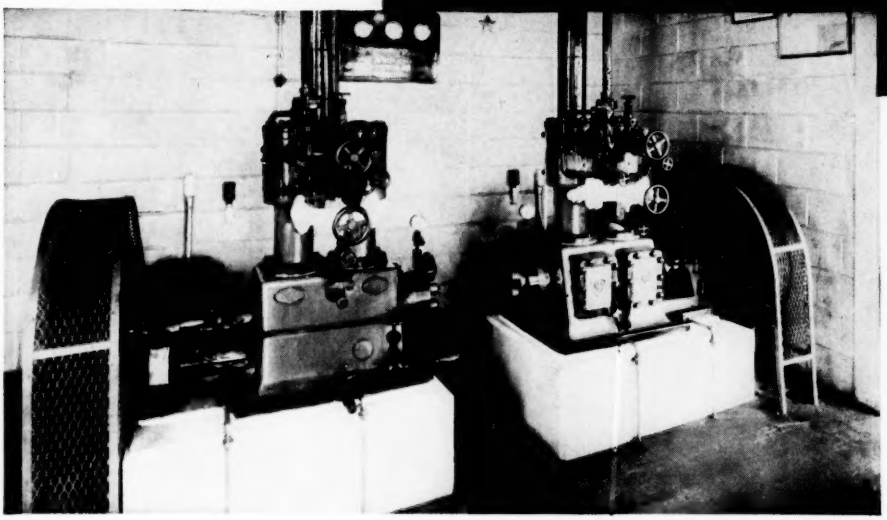
DOWN COME REFRIGERATION COSTS



EFFICIENCY is higher, maintenance costs lower, when your compressors stay clean. To assure continued cleanliness of both compressors and systems, and to get the maximum refrigeration from your compressors, lubricate with *Texaco Capella Oils*. Highly refined, and highly recommended . . . everywhere.

Texaco Capella Oils resist oxidation and gum and sludge formations. Tops for stability, they have very low pour tests, are moisture-free, and do not react with refrigerants.

Texaco Capella Oils are available in every needed viscosity. A Texaco Lubrication Engineer will be glad to help you select the proper ones for your compressors. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils

FOR ALL AIR CONDITIONING AND REFRIGERATING EQUIPMENT

TEXACO

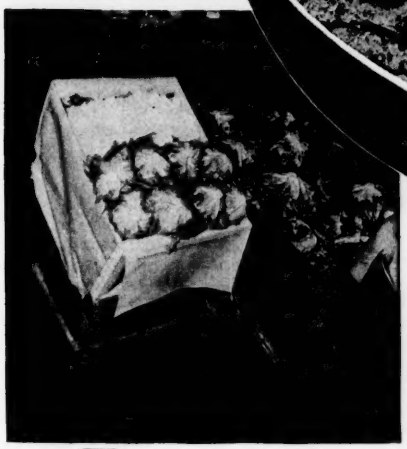
TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

Delivered Delicious...

A final layer of Vogtice is put in place before closing the crate.

Harvesting lettuce in the field with a traveling conveyor which delivers the heads to a truck.

Layers of Vogtice are placed on the crate bottom and between the courses of lettuce heads.

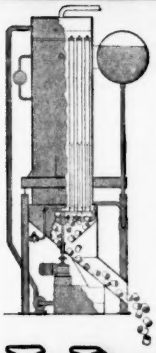


...straight from the Nation's "Salad Bowl"

Head lettuce from the Salinas Valley, California "Salad Bowl" graces the tables in American homes from coast to coast. In the season, shipments will average 135 refrigerator cars daily.

The J. J. Crosetti Packing Co. with headquarters at Watsonville, California is one of the largest growers and packers and operates a battery of four Vogt Automatic Tube-Ice Machines to provide Vogtice for carload shipments. The crates of iced lettuce are loaded in refrigerator cars and then a protective blanket of Vogtice is blown over them to retain freshness and crispness for distant markets.

Vogtice is playing an increasingly important role in the cooling, processing and preservation of foods and beverages. Our new Bulletin TI-3 gives the general information and will be sent upon request.



HOW THE TUBE-ICE MACHINE FUNCTIONS

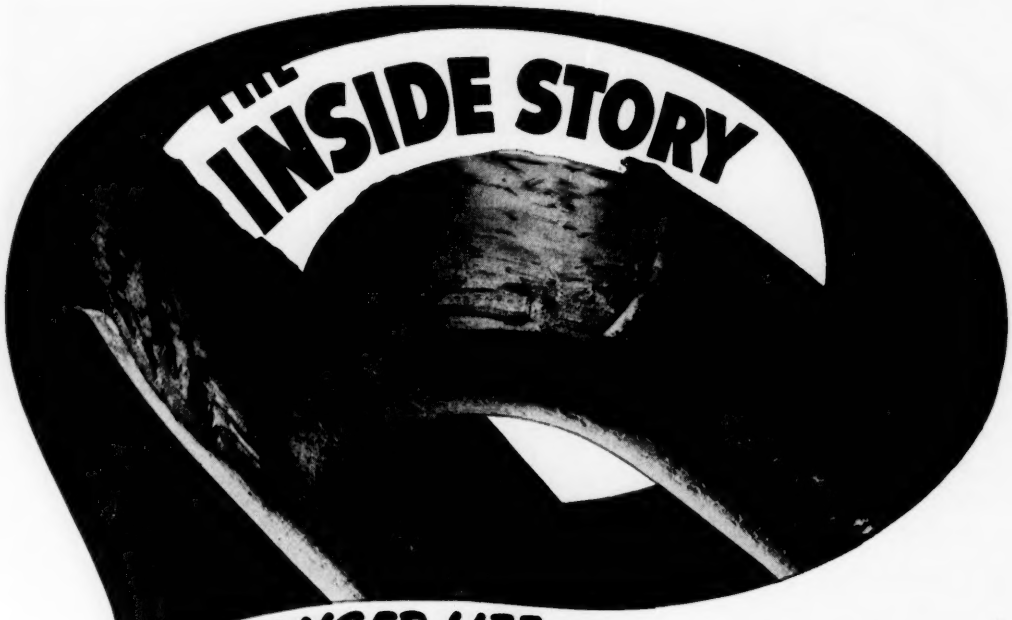
In making ice, water is pumped to the top of the freezer and flows downward along the inside walls of tubes into a water tank. Refrigerant in shell surrounds tubes and freezes water into cylinders of ice. An automatic timing mechanism operates suitable valves to control all functions of the machine. Ice is freed from the tubes by thawing when the refrigerant is displaced by high pressure warm gas from the compressor.

Employing direct application of the refrigerant, all expense incidental to other systems is eliminated.

Patent Numbers 2,200,424, 2,239,234, 2,396,308, 2,444,514, 2,453,140.

HENRY VOGT MACHINE CO., LOUISVILLE 10, KY.
BRANCH OFFICES: NEW YORK • PHILADELPHIA
CLEVELAND • CHICAGO • ST. LOUIS • DALLAS

Vogt *Automatic* TUBE-ICE MACHINE

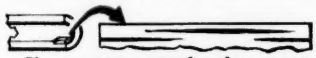


OF THE LONGER LIFE OF BYERS WROUGHT IRON

Every engineer will recognize this picture as a notch-fracture test specimen . . . and will appreciate the unusual physical properties suggested by the break.

The hickory-like fracture results from the unique structure of wrought iron. Tiny threads of glass-like silicate slag, 200,000 to 250,000 per square inch of section, are distributed through a matrix of high-purity iron. This fibrous structure, which might be compared to that of a stranded wire cable, equips wrought iron to withstand sudden shock, and to resist fatigue induced by continuing vibration.

Of even more importance in the average application is the *corrosion resistance* of wrought iron . . . which also comes directly from the unique structure and composition of the material. If a small section of wrought iron were placed under a microscope, a few of the multitude of silicate slag fibers would show up as in this sketch.



If corrosion attacks this specimen, it would first cover the entire surface . . . then concentrate at one point, and work inward. Soon it would encounter one of the slag fibers . . . and since this fiber is unaffected by corrosion, the inward march would be halted. This action is shown by this sketch.

Corrosion is now "detoured." It works right and left, until it comes to the end of the fiber, when it may start to work inward again. The process is repeated when the second line of defense is encountered. Pitting, and rapid penetration of the metal, is discouraged. Useful life is determined by how long it takes for corrosion to reduce the entire body of metal to its safe limit of thickness, rather than by how long it takes corrosion to perforate the wall at a few vulnerable points. The fibers also anchor the initial protective scale, which shields the underlying metal.

Every cost sheet today confirms the fact that the most expensive material you can use is that which must be replaced too soon—and too often. The extra service of wrought iron is helping tens of thousands of users to cut maintenance costs. We will welcome an opportunity to review your piping problem with you—and to recommend the places where wrought iron—on the basis of its past performance—can be profitably used. Ask for our booklet, "THE A B C'S OF WROUGHT IRON."

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, San Francisco. Export Division: New York, N. Y.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

Ice and Refrigeration

VOLUME 119 NUMBER 5

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November 1950

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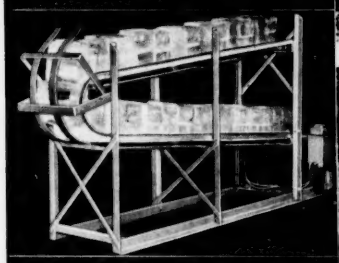
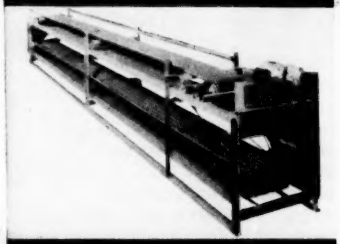
A FRIGID-VEND Ice Station has the Rugged Construction of a Refrigerated Highway Trailer

4 TYPES OF VENDORS

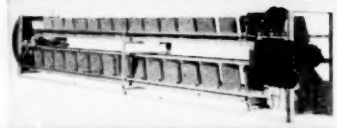
Will fit any Frigid-Vend Ice Station. Can also be purchased separately for installation in any ice storage room. Equipped with fool-proof mechanism and coin box. PRICES START AT **$495.00**



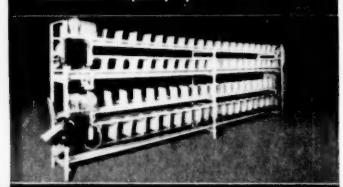
GRAVITY VENDOR for vending ice blocks direct from cold room. Capacity up to 54 units.



METAL BELT BAG VENDOR double-deck. For 7½ lb., 10 lb. and 12½ lb. bags. Capacity up to 62 units.



CHAIN DRIVEN BAG VENDOR double-deck for bags or cartons of crushed or cubed ice. Capacity up to 42 units.



CHAIN DRIVEN COMBINATION BAG AND BLOCK VENDOR four-deck. Capacity up to 76 units.

A FRIGID-VEND Ice Station lasts longer because it is more sturdily built. The same construction, which year after year keeps a swaying refrigerated trailer "cold-tight" on a bumpy highway, is used in these ice stations. Exterior is of 24 gauge rust-resistant Galvannealed steel panels mounted directly on a steel structure, (not wood) thus preventing warping. Walls, roof and floor are insulated with 6" of Rock Wool, consisting of two 3" layers of Rock Wool batting with waterproof paper on both sides of each batt. Interior is waterproof plywood. Furnished in four sizes complete with refrigeration, light fixtures and wiring—ready for operation.

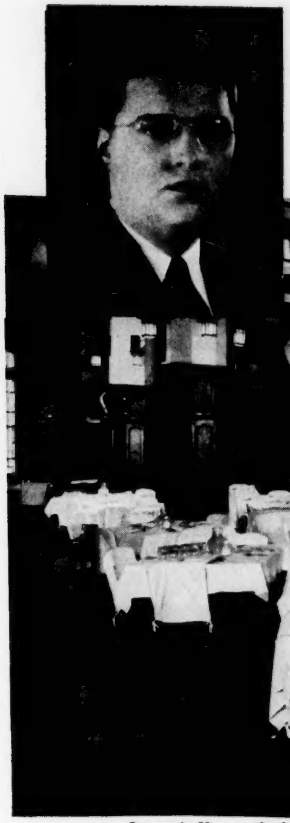
Block Vendors also available in metal belt and chain driven vendors. Coin boxes can be had with or without totallizers for any combination of coins.

WRITE FOR COMPLETE DETAILS

THERMO CUBER

THERMO CUBER CO., INC.

2120 No. Southport Ave. • Chicago 14, Ill.



"Fine food demands cleanliness so we insist on Packaged Processed Ice"

SAYS W. C. GENTRY, SAVOY GRILL, KANSAS CITY, MO.

For nearly 50 years the Savoy Grill at 9th & Central, Kansas City, has been known for its live Maine lobster, fresh seafood and prime steaks.

One-Trip Paper Ice Bags Put New Life in the Ice Business

PEOPLE who sell food can't take a chance with cleanliness! That's why so many of them insist on buying their ice in Union One-Trip Paper Ice Bags that lock out all dirt and contamination.

And it's lucky for you they do! Consumers ice more often with convenient-sized, easy-to-handle Union Paper Ice Bags. They are easily carried and speed up handling on the platform, in loading and at the delivery point. And the double layer of Union wet-strength, water-repellent paper acts as an insulator to retard melting.

Hundreds of ice companies are now using Union Paper Ice Bags. Write for further information and free samples.

Wet-Strength Paper Ice Bags have tremendous strength even when soaking wet . . . thanks to a water repellent resin that binds the fibres of the paper firmly together.

ONE TRIP

UNION Paper Ice Bags

A product of the UNION BAG & PAPER CORPORATION • Woolworth Bldg., New York 7, N. Y.

Bags of Kraft, Transparent Films, Waxed Paper, Glassine, Laminates

Relief Valve
Size range: ⅜" thru 2"
Screwed Bonnet Shut-Off Valve
Size range: Globe and Angle, ¼" thru 1"; Tees, ⅜" thru 1"
Bolted Bonnet Shut-Off Valve
Size range: Globe and Angle, 1¼" thru 2"
Check Valve
With or without seat lift. Size range: ½" thru 2"
Flanged Shut-Off Valve
Size range: Globe, 1¼" thru 4"
Three Way Dual Shut-Off Valve
Size range: ½" thru 1", capped and handwheel types
Expansion Valve
Size range: Globe and Angle, ¼" thru 1"
Liquid Level Gauge
Forged Steel
Size range: ⅜" and ½"
FIELD PROVEN FEATURES
HAVE MADE
HENRY AMMONIA VALVES
THE MOST POPULAR LINE
IN THE
REFRIGERATION INDUSTRY
HENRY VALVE CO.
CONTROLLING FLOW
SINCE 1914
See Your Jobber —
Write for Catalog
VALVES • DRIERS • STRAINERS • CONTROL DEVICES and ACCESSORIES FOR REFRIGERATION and AIR CONDITIONING and INDUSTRIAL APPLICATIONS
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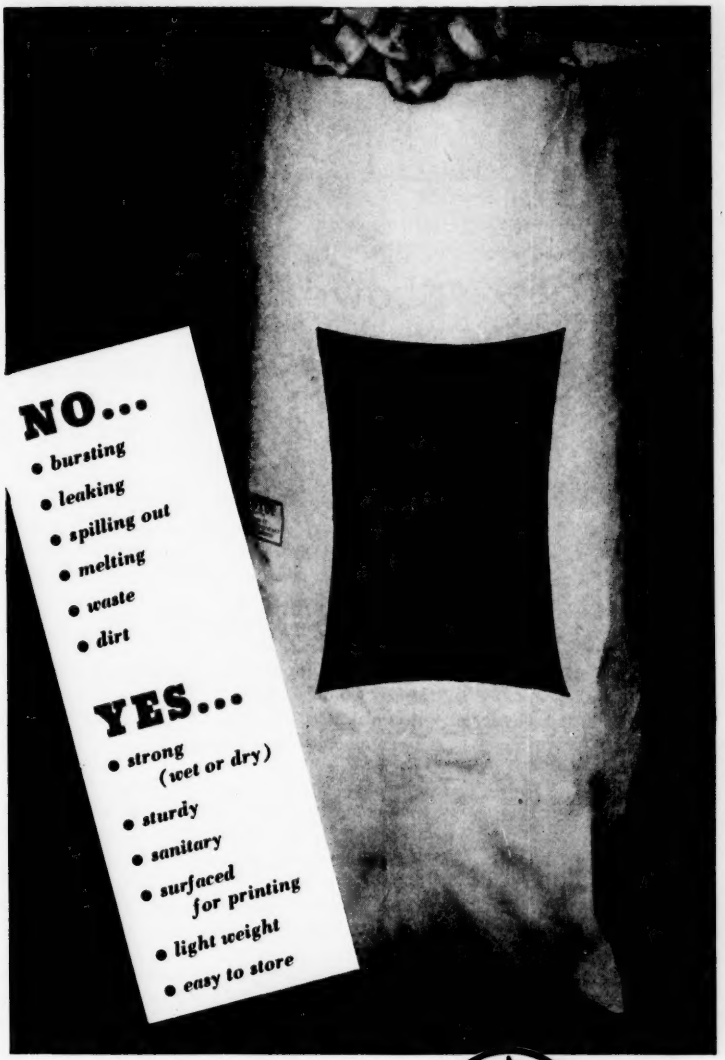
SIGN YOUR NAME to your good service with.....

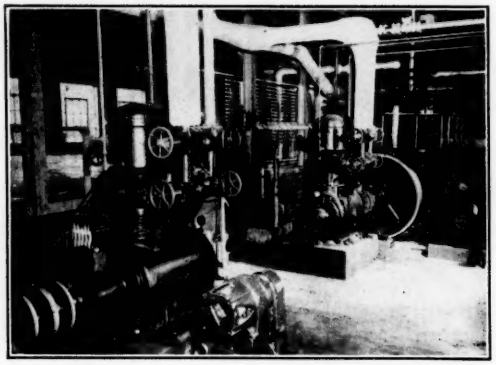
INTERNATIONAL ICE BAGS



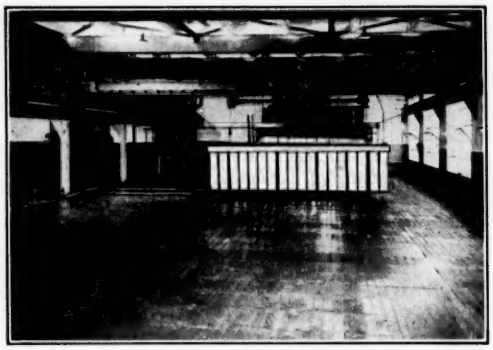
Do right by your product! Deliver it in International Ice Bags printed with *your* name and advertising message!
Printed bags "TELL and SELL."
That's the easiest, most economical way to keep your product and service sold—
Made of HYDROTUF* paper.
The extra strong wet strength paper.

INTERNATIONAL PAPER COMPANY
SOUTHERN KRAFT DIVISION
NEW YORK · CHICAGO

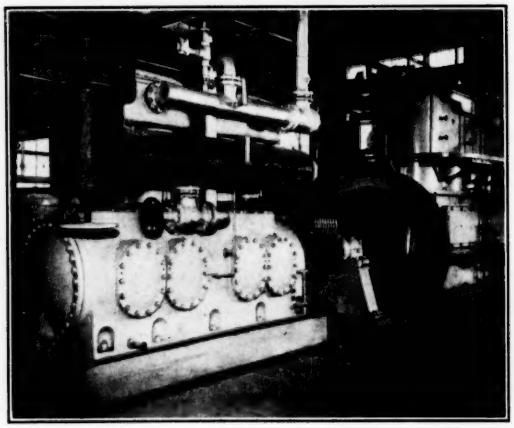
*Trade Mark



Pair of 11 by 10 Frick Compressors, with 200-hp. Engines, at the Independent Ice Co., Raymondville, Texas.



These Two Tanks at Edinburg, Texas, Makes 300 to 340 Tons of Ice Daily. Note Use of Frick Can Grids.



Four-cylinder 14 by 12 Frick Compressor and 425-hp. Natural Gas Engine at the Edinburg (Texas) Ice and C.S. Co.

Showing Location of Frick Installations in the "Magic Valley" of the Rio Grande.

Lower Rio Grande Valley Served by Four FRICK Plants

The "Magic Valley" of the Lower Rio Grande extends 80 miles west of Brownsville, Texas. This rich area enjoys warm winters and extensive irrigation; its citrus fruits, early vegetables and cotton support 200,000 people.

For handling the vast shipments of fruits and early produce, including 60 per cent of the grapefruit raised in the U. S., refrigeration in large amounts is required.

In the last few years important ice-making plants have been erected at Raymondville, Edinburg and Matamoros, while a huge quick-freezer is in operation at Brownsville.

All these are Frick-equipped. The ice plants harvest nearly 500 tons a day.

Let Frick refrigerating, quick-freezing and ice-making equipment aid in solving your problems. Call in the nearest Frick Sales Engineer today.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery.

In The Spotlight

THE SIZED ICE patent held by Orrison has been held invalid by two federal district courts. These cases probably will be appealed, and an additional suit has been filed in Washington, D. C. For details see story on page 27.

SKATING ON ICE outdoors in summer was featured by Ice Varieties at the Chicago fairs of 1949 and 1950. How the ice floor was produced and maintained is told in the article on page 23.

PUBLIC RELATIONS Funds (for National Ice Advertising) will be raised for 1951 by a series of letters to be written to all ice men by other ice men in their state. Details of the program are told in story on page 25.

800,000 CUBIC FEET of freezer storage space in a single room is included in new additions to the Pasco Packing Co. plant, Dade City, Fla. Details of this increased capacity are given in the article on page 21.

FOUR NEW ENGLAND ice companies have joined in a cooperative ice appliance merchandising program with a retail sales and show room at Providence, R. I. See page 28.

SPLIT PEA SOUP for a famous California restaurant is processed and stored by the Polar Ice & Cold Storage plant at Santa Barbara. The story is told on page 43.

FROZEN LIQUID EGGS, of which about 35 million are processed under government auspices each year are a drug on the market. A method of freezing them in the shell, in which condition they can be stored a year or more, has been developed at Louisiana State University. See page 45.

COVER PICTURE: Maintenance of refrigerating equipment is an all year program, especially now with the possibility of short supplies and replacements. This is a view of the engine room in plant of the Mountain Ice & Coal Co., Pueblo, Colo.

LOS ANGELES will be the host city for the 41st annual convention of the National Association Practical Refrigerating Engineers, November 28 to December 1. For convention program and other details see page 35.

FROZEN FOODS are entering a "golden era" in which annual consumption should attain a volume of three billion pounds before the end of 1953, according to Howard F. Lochrie, director of marketing for the Birds-Eye-Snider division of General Foods.

SEED CORN can be kept in cold storage, preserving its germinating qualities for many years. Valuable seed can thus be preserved as insurance against crop failures and other disasters such as floods.

EGG LOSSES amounting to nearly twenty million dollars a year are resulting from lack of adequate cooler storage by country buying stations.

Maintenance Articles

THE PROBOLOG, a new portable instrument detects and records corrosion conditions and irregularities in tubes made of non-magnetic material. It is illustrated and described in article on page 14.

A REGULAR plant maintenance procedure is necessary to keep a refrigerating plant operating at its maximum efficiency. This procedure is especially important now that war problems may return to make parts and supplies scarce. See page 11.

MAINTAINING cold lines and equipment in good equipment can be accomplished by following a few simple rules. The procedure and objectives are described in the article on page 15.

MOTORS can give long and efficient service if carefully installed and maintained. This does not require a great amount of work and expense as explained in the article on page 17.

LETTERS

Reference is made to the article which appeared in the October issue of ICE AND REFRIGERATION titled "The Ice Man and His Problems."

We of Seaboard have an ice operation which covers two counties, involving the operation of two manufacturing plants totaling 456 tons. After reading your article I decided to check over the six primary needs of the ice business as outlined in the latter in order to objectively evaluate our operation in relation to the six points. It was gratifying for me to discover that in most cases the operation seems to exemplify what a modern ice operation should be. May I respectfully add two more points to the aforementioned list?

A. Clean and up to date equipment.
B. Route service that would be equivalent to the modern delivery of normal consumer and commercial merchandise.

Our main effort has been to maintain tonnage against the inroads of the mechanical substitute. To that end we have been distributing the enclosed literature on automatic ice makers to every conceivable ice user in our territory.

It is very difficult to measure the effectiveness of such literature, but we feel that any constructive attempt based on truth and fact and properly presented to the public will in the long run maintain tonnage that would otherwise be lost to mechanical substitute.

Enclosed you will find a copy of the aforementioned literature with the hope that it will be of some value to other manufacturers in combating the mechanical substitute. (NOTE: A description of this folder is published on another page of this issue.)

D. KRUMAN, Sec'y. & Treas.
Seaboard Service
Neptune City, N. J.

...is one way to bigger profits

Expensive "muscle power" in an ice plant is a continuous drain on profits as well as a man's constitution. It needn't be. Because a G-W slat conveyor is a big labor saver... moves bagged and cake ice around the plant or to delivery platforms in less time and with fewer broken cakes. That adds up to lower over-head—more sales—bigger profits.

G-W conveyors are designed to carry block or processed ice in bags on straight, curved or right angle sections, from room to room or the outside platform. Unlimited flexibility assures an arrangement to fit perfectly your plant layout.

A Gifford-Wood engineer will be glad to visit your plant upon request. He is ready to apply 135 years of ice handling experience to any problem you may have without obligation. Call him in—let him show you the G-W way to bigger profits.

GIFFORD-WOOD CO.

Since 1814

Hudson, New York

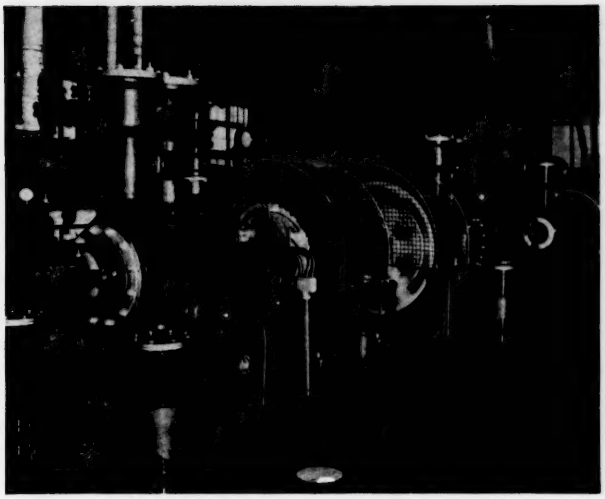
420 LEXINGTON AVE. NEW YORK 17 | RAILWAY EXCHANGE BLDG. ST. LOUIS 1, MO. | 565 W. WASHINGTON ST. CHICAGO 6

Pacific Coast Representative:
WESTERN ICE EQUIPMENT COMPANY, 420 Market St., San Francisco 11, Calif.

6772

When You Think of Materials Handling, Think of GIFFORD-WOOD

Well maintained equipment usually shows the care it receives. Also this care shows up in the economy of plant operation. A clean, well kept engine room shown at the right is a good indication that the equipment will operate efficiently and economically. Note the complete guards on the fly-wheel type motors; they provide good protection yet are designed for easy removal to permit inspection and maintenance of the equipment.



REGULAR PLANT MAINTENANCE

War problems return to plague the plant engineer. A maintenance program, well-planned in advance and carried through, is only way to keep plant in good running order.

L. P. REISS

DURING the last war all of us learned how perplexing maintenance problems could be. The people who faced the greatest tasks and disappointments were those who had not followed a regular plant maintenance procedure in the earlier years. They were faced with the necessity of securing parts and supplies during a period of scarcity and further the manpower shortage multiplied the difficulty of accomplishing a successful maintenance program.

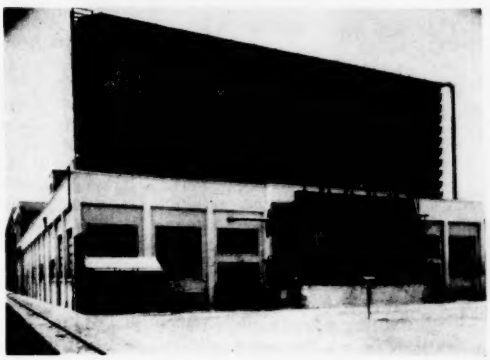
Plan in Advance

As we begin the 1950 maintenance season in refrigerating plants we wonder whether we are entering a period when the same problems again will have to be met. Little time need be lost in speculation along this line. All of us should have learned from the past that it is well to plan the maintenance program as far in advance as possible and then carry it through to completion without any delays except those forced on us by necessity. The well planned program accomplishes the most satisfactory results.

Orders for material and supplies should be placed as soon as needs have been determined. Most of these requirements have made themselves evident during the peak operating season so there should be no delay in ordering the items not generally carried in the parts stock of the plant.

In some cases the condition of the equipment must be judged by inspection before exact needs can be determined. This equipment should be placed at the top of the inspection schedule so that any special requirements in the way of parts or heavy maintenance can be lined up or arranged.

Where plans and inspections have been delayed there is still time to proceed in orderly fashion if the required initiative is employed. It was my good fortune during the summer of 1944 to be invited to plan a heavy maintenance program for a company that owned more than 20 ice plants. The president of this company decided to make changes to 24 ice tanks by changing these tanks to flooded systems. The plans to do this work were completed in September and the work started early in October. Yet the changes to all the tanks were



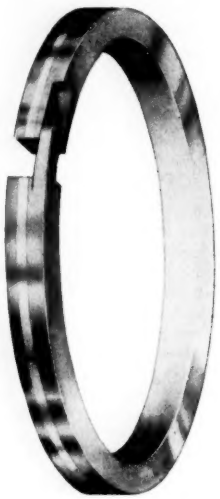
The final path of heat in the plant is to the water in the condensers and out to the air through the cooling tower. All the heat from the plant must be dissipated to atmosphere by means of the cooling tower.

completed by the end of February.

Most of the compressors in these plants were opened for inspection and where necessary, new rings were installed and valves ground or replaced. In nearly all cases, the headers in the tanks and the suction lines to compressors were enlarged. Accumulators and ammonia float valves were installed. The result of these changes was that this company made over 30 000 tons more ice the following year with the same compressors and the same number of cans.

Compressor Maintenance

The refrigerant compressor is a very important part of your plant. Unless it operates efficiently, maximum production will not be obtained. The question is often asked—should I rebore the cylinders of my compressor? Before that question can be answered intelligently, it is necessary to take micrometer measurements. If a cylinder wall is badly scored or out of round as much as .025 to .300, it should be rebored.



A bronze insert piston ring. The bronze shows lighter in this photo but is not to be confused with a bearing metal insert.

Oversize pistons may not be readily available. Pistons built up with bronze, then turned to the proper size will operate satisfactorily. During the war years, quite a number of compressors were repaired in this manner, and, so far as I know, are still operating efficiently. Bronze inserted rings have been used in ammonia compressors for many years. This type ring will polish a cylinder, while a plain cast iron ring may cause excessive wear after reboring, particularly if there is insufficient lubrication.

Valve Openings

Increased speeds and higher suction pressures call for more valve opening, especially discharge valves. When new safety heads with more valve area were not available, an increase in valve lift will sometimes stop valve noise and increase the compressor efficiency.

Crank shafts often show excessive wear in the stuffing box due to using the wrong kind of packing. This makes it difficult to keep the ammonia from leaking out through the stuffing box. Shafts may be built up to regular size by metalizing. When properly done, it will make a perfect job which will last many years. Shut-off valve stems may be treated in the same manner. Shut-off valve seats and discs should be examined and renewed if worn or cut out. All valves should shut without leaking on hand closing. Now is also a good time to initiate a program of protecting valve stems and other exposed parts against rapid deterioration, especially under sweating conditions.

The ammonia condenser is also an important part of your plant. Regardless of what type it may be, it requires attention. It should be kept free of foul gases and oil at all times. The water surface should be kept free from scale, algae or any other foreign substance. Thermometers should be installed so as to obtain the temperature of the water leaving and of the liquid ammonia draining to receiver. If the water leaving is more than four to six degrees lower temperature than the liquid ammonia, the condenser needs cleaning. If there is no refrigerated purger provisions should be made to install one this season.

Ice Tanks

In ice plants the freezing tank is the place where all heat transfer takes place between the water to be frozen into ice and the ammonia. Proper brine circulation is very important. Bulkheads should be tight and high enough to prevent short-circuiting of the brine. Agitators should be of proper size and speed so as to maintain a brine velocity of not less than twenty-five feet per minute. Quite frequently, a vortex will form near the agitator which sucks air into the brine. This should be stopped by placing a horizontal baffle a few inches below the brine level around the agitator. The salometer reading should be between 75 and 85 at all times. A weak brine is more corrosive than dense brine. Brine density should not exceed 86. Above that density, the freezing point goes up. There are many other things about a brine tank to be checked. Can submergence, air agitation, corrosion inhibitors, tank insulation, all those and many more require the operator's attention.

The water treating equipment is sadly neglected in many plants. During the war years, quality was a forgotten expression around an ice plant. Quantity was uppermost in the minds of the boss. It is high time for the industry to about face on the quality problem. Water treating for ice making is a subject by itself.

It would improve quality of most ice plants if the water treating equipment had a face lifting. Filters should be repacked, sludge tanks washed out, lime mixers cleaned out, and the testing equipment cleaned up. Testing will not be accurate unless the chemicals are carefully maintained and properly labeled. The testing cabinet should be located where light is good and readings can be made accurately.

Cooling System

Pumps of various sizes are found in any ice plant. The ammonia condenser pumps and brine pumps in cold storage plants are generally the largest. The core pump is generally the smallest. Regardless of size, they all need attention. Each pump in the plant should be opened at least once a year. If scale has formed in the housing and impeller or foreign matter lodged in the vanes, it should be removed. Seal rings should be renewed if too loose. Shaft or shaft sleeves when worn should be renewed if necessary. Pump shafts may be metalized if worn in the stuffing box area so as to bring them up to the original size. Check the suction and discharge lines for scale formation. They may need cleaning.

The Cooling Tower

We now come to the most useful, the least understood or appreciated, and the most sadly neglected piece of equipment around an ice plant. The cooling tower. Here all the heat gathered by the ammonia in the evaporator and suction line, plus the heat of compression is liberated. Unless the cooling tower functions properly the plant cannot operate efficiently. The following example explains why this is true.

Sometimes the question is asked, "How can we make a ton of ice with 50 kwh?"

One kwh contains 3412 Btu, 50 kwh equals 50 times 3412 equals 170,600 Btu.

To make one ton of ice, it requires approximately 288,000 times 1.7 equals 489,000 Btu.

The answer is the water used on the condenser does all the work. Power is used to circulate the ammonia and water so the water can get the heat and take it away to the cooling tower.

Cooling towers should by all means be included in your maintenance program. There are several different types of towers. Mechanical draft towers require motors and driving mechanisms. This mechanical equipment should be thoroughly inspected during the off peak season. Motors should be cleaned. Oil should be changed. All worn parts on driving gears should be replaced if necessary. If V belts are used they may need replacing. The decks in all towers either natural draft or mechanical should be inspected and repairs made if necessary. Louvres should be replaced if missing or when badly warped.

Motors and Accessories

All motors in refrigeration plants should be thoroughly inspected at least once a year. Air vents should be blown free of dust and dirt. Rotor clearance should be checked. If the rotor is found too low new bearings should be installed. Windings should be freed of all oil and dirt then painted with a good insulating paint. Ground connections should be inspected to see that they are in good condition.

Air blowers and air compressors should be opened for inspection and cleaning. Where compressors are used suction and discharge valves should be made tight if found leaking. Air filters when used should be cleaned. Air blowing hose should be renewed if found cracked or full of holes. Air nozzles should be cleaned and air holes on perforated drop tubes should be cleaned out. Care should be exercized so those holes will not be enlarged as it will affect the air discharge.

Electric drill and all tools should be kept in good condition. Cords to electric tools should be repaired or renewed if insulation is broken. Extension cords likewise should be maintained in a condition where they will not be a safety hazard. All cords used should be of approved type with a tough, heavy cover.

There are two principles from which the plant operator must choose his over-all method of operation. These are Adequate Maintenance or Early Replacement. In times past when equipment was lower in cost a better case might be made for the Rapid Wear and Quick Replacement policy. Now equipment costs have greatly increased although the price of what it produces may not have gone up so much.

One way to offset increased costs of the present era is to lengthen the life of the equipment by giving it good care. Large compressors usually have good care but sometimes the same care and maintenance is not extended to piping, valves, insulation and other less spectacular equipment. Yet all of these are vital to operation and costly to replace. With a little study and observation, the case for a good maintenance program proves itself.

General Inspection

In addition to electrical hazards there are a number of others that should be considered during the maintenance season. It would be a good plan to take a notebook and make a special inspection of the entire building and grounds. During peak season the emphasis is on production. Deterioration may go on unnoticed or temporary repairs may be poorly made. These are some of the matters that should be included in the inspection of the plant, although the range covered should be wide.

Stairs and rails should be in good repair. Are machine guards adequate and properly fastened in place? Is the gas mask in good condition with fresh canisters and stored in the proper place? How recently were the fire extinguishers renewed? Has trash or any combustible material been allowed to accumulate? These are only a portion of the matters that should have attention when the inspection is made.

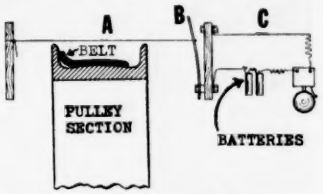
Keep Equipment in Good Shape

The equipment to be used in the maintenance work should all be in good shape and ready for use. For instance a defective ladder is a great hazard in itself. Cracked rungs or split steps should either be repaired or the ladder replaced. Where rope has been neglected and is of doubtful strength it is better to buy new rope and provide a special place where it can be held in good condition. All the other equipment should be prepared so that the different maintenance tasks can be carried out without delays from this source.

Maintenance work is not just an accumulation of work to fill in between peak operating seasons. A complete well rounded program will reduce operating cost and make for continuity of service. It pays dividends.

The Bell Rings When Something Goes Wrong

THIS sketch shows how you can easily make a safety device of your own. The thread A holds a brass strip B away from a contact point as indicated. Thus for example a belt is shown on a flanged pulley. The belt is beginning to climb one



of the flanges. As soon as it starts over the edge it will rub against thread A and the brass strip B will be freed making a "closed circuit" through the wire C. The batteries will then ring the bell shown.

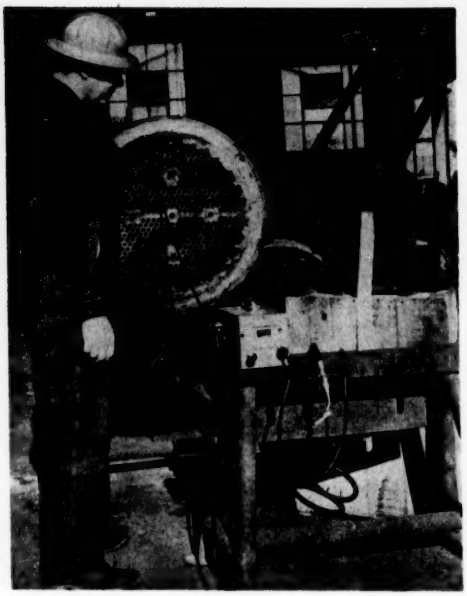
A device of this kind is applicable to a wide range of services. It needn't be made exactly like this, of course. The purpose of this diagram is merely to furnish the idea. The thing to do is to catch a fault or possible danger before it gets too far.—S.F.W.

Permanent Installations Must Be Inspected

IN ADVERTISEMENTS we commonly read such statements as this: "Install it and forget it". That advice may apply to some things such as a foundation under a building for example. It would be unfortunate if we should find it necessary, each year, to inspect installations that are intended to be permanent.

However, one of our failings is to ignore too many important things. Take insulation, for instance. Many users of insulation take it for granted that insulation is "permanent" and doesn't need inspecting. To be sure if the insulation is completely covered and isolated and unreachable, it cannot be inspected. Pipe covering though, in general, can be inspected and should be inspected at least once each year. As stated by the chief engineer of a prominent insulation company. "There is no such thing as too frequent inspection, from the manufacturers point of view."—W.F.S.

Checking Heat Exchanger Tubes With Electronic Device



An instrument for the non-destructive inspection of tubes in heat exchangers and other tubular equipment was recently demonstrated at a meeting of San Francisco Chapter, N.A.P.R.E. Called a "Probolog" it is a portable instrument that detects and records all types of corrosion conditions and irregularities in tubes made of non-magnetic material. It is used in tubes of copper, admiralty metal, copper-nickel, aluminum, austenitic stainless steels.

The Probolog is shown in operation on checking the tubes in a heat exchanger. The instrument itself is the black box at the right from which the paper tape is issuing. A graphic representation of the tube condition is registered on this tape. The box at the center is the probe puller. By means of the cable it pulls the sensitive element (probe) through the tube at a set rate of speed. Next on the metal stand to the right is a probe injection gun which uses compressed air to run the probe to the far end of the tube.

IN THE past, if an engineer desired to learn the condition of a tube within a bundle, it was necessary to remove the tube, saw it in two lengthwise, and examine the now useless tube. Then it was a matter of estimating the condition and life expectancy of the other tubes. It is not necessary to disturb the tubing in any way to uncover its condition by means of the Probolog. In fact, damage which cannot be seen by eye even in a split tube, may be disclosed by this sensitive device.

The instrument is an electronic product. A small probe, designed to fit the diameter of the tube is inserted and then withdrawn at a set rate of speed through the length of the tube. As the probe, containing two tiny induction coils progresses, the Probolog makes a tape chart of the tube condition. The tape indicates such diverse imperfections as erosion, variation in thickness, dezincification, and mandrell chatter. Incipient pinholes also show up so that the life expectancy of the tube in service may be reasonably predicted. The sensitivity of the instrument is great. In demonstration it has been shown to detect the scratch of a fingernail file made on a tube being inspected.

When heat exchange or other tubular equipment breaks down, usually as a result of excessive corrosion, the costs can be considerable in the loss of production. Accidents resulting from failure of tubing also may cause injuries and destruction of property. To avoid this, many tubes have been taken out and discarded as a matter of precaution although their condition, if adequate inspection were available, would have been found to be very good. Thus the loss in time and material mounts up.

Inspection of Tubes

Regular inspection of tubes by means of a tool capable of detecting approaching breakdown or failure would permit continued safe operation. The Probolog was devised to render this inspection service. Designed by engineers of the Shell Development Company, Inc., it was originally employed on equipment in the petroleum and allied fields operated by the Shell Oil Company. Since that time, it has been further improved and made available to industry at large.

The improved Probolog has a higher probe speed. It is drawn through a tube at the rate of four or twelve feet per minute. Only one probe is necessary for non-magnetic tubes of the same size regardless of whether they are brass, stainless steel, or any non-magnetic metal.

The instrument, as shown in the illustration, is portable and sufficiently durable for field use. The components which make up the complete instrument are the probe which is the sensing element. It contains an insulated electro-magnetic pick-up unit, which is furnished with a length of rubber covered cable for connection to the recorder. The electronic recorder which operates from 110 volts ac incorporates the remaining electrical circuits and the recording mechanism with provisions for adjustment. Also a clock motor synchronized with the movement of the probe through the tube, drives the strip chart. A mechanical probe puller is connected to and operated from the recorder. It provides a pulley and gear shift to engage and pull the probe cable at two different speeds.

Because of its sensitivity the Probolog detects any abnormality in the tube being checked. It is reported, however, that operators of the instru-

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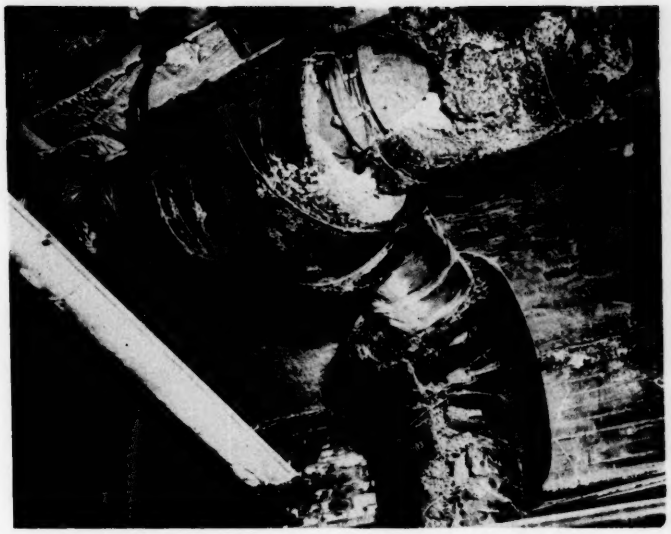


Here's what eventually happens when pipe covering is abused and neglected over a period of years. Repeatedly bumped by ladders, hand-trucks and the like, or squeezed and wrenched by hoist chains, or harmed by other mechanical abuse, the covering finally cracks, frost forms in the cracks, and then crawls along the pipe to play havoc with the covering. The line shown here is now closed down for replacement of the covering. Good, regular maintenance would have prevented this.—Armstrong Cork Co. Photo

Maintaining Cold Lines and Equipment

By following a few simple rules, insulated coverings of refrigerated pipe lines can be maintained in good condition and their useful life prolonged for many years.

C. B. MARTING
Manager, Low-Temperature Insulation Department
Armstrong Cork Company

PROPER maintenance of cork covering on refrigerated lines is good business. In fact there are few investments that yield as much return. By following a few maintenance rules regularly the life of a cork covering job can be prolonged indefinitely, but failing to maintain the material properly may mean costly repairs within a relatively few years.

In simple terms the maintenance of cork covering consists of replacing loose or broken wires, repairing small breaks with brine putty and painting with Cork Covering Paint. The average cost of this procedure is negligible compared to the value of the insulation. Very badly damaged covering will cost more, and covering in good shape will cost less. But the point is, that installations maintained by this method don't seem to wear out. There are jobs on record that are twenty-five or thirty years old which are still giving excellent service because they have been kept in good shape by a attention each year.

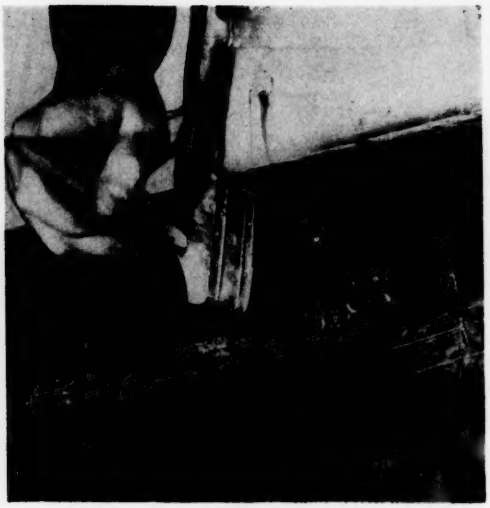
It's almost impossible to estimate the cost of failing to follow a regular maintenance program. Certainly refrigeration loss is something to be considered. Since a badly damaged section of covering is almost as inefficient as no covering at all, a good idea of this expense can be secured by comparing an uninsulated and an insulated line. The extra cost of refrigeration loss each year of an uninsulated line is greater than the cost cost of insulating that line.

On cold lines and equipment a do-nothing policy does not save money,—it increases overall costs considerably. A well-insulated job can be maintained at very low cost so that it will have useful life stretching into many years. Abuse and neglect on the other hand can quickly bring high costs including heat leakage, insulation replacement, and even deterioration of the line or equipment itself.

Furthermore, damaged covering increases the rate of deterioration of the whole job much like "one rotten apple spoils the whole barrel". Condensation will form on those damaged areas, creep into and under the good insulation, and cause it to go bad, too. Also condensation rusts piping, often making its replacement necessary, and with the high cost of pipe today this can prove to be quite expensive. Even assuming that it's not necessary to replace piping, the labor cost of removing old insulation and wire brushing the piping for re-insulating must be taken into account. Taking all these factors together, not counting the replacement of any pipe, it will cost more per lineal foot to tear down old insulation and replace it with new material than the original cost per lineal foot.

While all of the examples cited above are based on cork covering for pipe, the same is true of tanks and vessels. For both a yearly program of maintenance should be followed for the best results. Usually the winter months is a good time for inspecting and repairing insulation that is indoors. Then the refrigeration load is less, and in many types of business it is a slack season. Obviously outdoor lines and equipment should be repaired during warmer weather when working conditions are better.

Seam filler is troweled into any seams or other voids which have appeared in the insulation.—Armstrong Cork Co. Photo.



Applying cork covering paint, a simple part of an important maintenance operation.—Armstrong Cork Co. Photo.

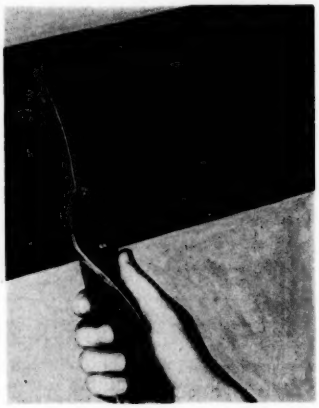
Indoor Lines and Equipment

On indoor lines and equipment the first step in maintenance is to go over the wires and bands to make sure that they are all tight and in place. Loose wires can be tightened, missing wires should be replaced. As a guide to replacing them, there should be at least six wires to each 3 foot section of pipe covering. Only copper clad steel wire should be used, because it alone has both the strength and the corrosion resistance that is necessary. The gauge of wire to be used depends upon both the diameter and weight of the pipe covering according to the following table:

Pipe Size, In.	Wire Gauge
Light Duty Cork Covering	
¼ to 3 inclusive	14
3½ to 10 inclusive	12
12 to 20 inclusive	10
Standard Cork Covering	
¼ to 1½ inclusive	14
2 to 8 inclusive	12
10 to 20 inclusive	10
Heavy Duty Cork Covering	
¼ to ¾ inclusive	14
1 to 6 inclusive	12
8 to 20 inclusive	10

On the larger pipe sizes, say from 2 in. up, bands are frequently used. Bands should be placed 8 in. to 9 in. on centers. They should be galvanized bands made especially for use with insulation, Monel metal, or stainless steel, 0.5 in. wide and 0.015 in. thick.

As the bands or wires are being replaced, the covering should be closely inspected. Covering in very bad shape should be replaced with new covering. Dents, gouges, and deep scars can be repaired with cork seam filler. This material consists of a blend of asphalts, solvents, and special reinforcing fibers that give it putty-like characteristics. For large holes it can be trowelled on; for small blemishes, most mechanics use their thumb much as a carpenter fills nail holes with putty.



Broken wires or straps should be replaced promptly to maintain a durable job.—Armstrong Cork Co. Photo.

The next step, painting with Cork covering paint, is the biggest part of proper maintenance. The paint will fill small cracks and crazes in the old finish and keep them from getting larger. It also cuts down moisture and air leaks into the insulation. Applied on the wires and bands, it prevents them from being attacked by corrosion.

Good cork covering paint is a heavy body asphalt dissolved in petroleum type solvents and containing no fillers. As a result it provides a continuous film of asphalt all around the covering and dries to form a hard impervious film. It not only resists moisture and air penetration, but also it is not affected by brine, ammonia and the other fumes commonly found around refrigeration plants. This cork covering paint should be used just as it comes from the can. No thinning is necessary. It should be applied by brush and will cover about 180 square feet per gallon.

On indoor lines finished with canvas and paint this maintenance procedure is not necessary. Except for bad dents that have broken through the canvas jacket, the only maintenance required is repainting as often as necessary—usually every three to five years. Where severe damage occurs the covering can be repaired with either new covering or seam filler, then a patch of new rosin sized paper, canvas, and paint should be applied.

Outdoor Lines and Equipment

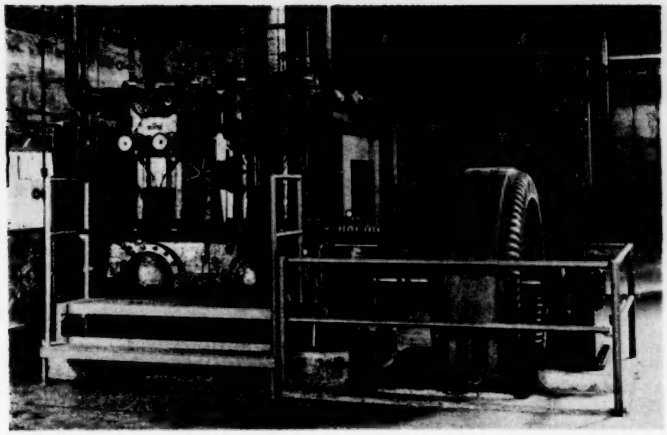
Maintenance of outdoor lines and equipment depends upon the type of finish that was originally used. There

(Continued on page 58)

MOTORS CAN GIVE LONG SERVICE

A horse is judged by its teeth and a motor by the condition of its insulation. Regular care is important to long life and good operation.

WILLIAM TIFFIN
Ideal Electric & Mfg. Co., Chicago, Ill.



Large motors like this one usually are carefully installed and maintained. A 700 hp Ideal Synchronous, it demands attention by its impressive size and evident value. Smaller motors may not receive such good care although they are expected to give the same reliable service.

FORTUNATELY refrigeration plant operators are engaged in somewhat of a seasonal operation. Storage plants and process refrigeration operations approach a full time basis as do ice cream plants. Ice plants, quick freezing, and comfort cooling are very seasonal. However, in spite of the fact that every effort is being made to expand into diversified fields for off-season operation, winter months mean a period of reduced output. This is the time to supplement brief inspections allowed during the operating season with thorough inspection and needed repairs.

If the field should demand a very nearly continuous year round output, as in the packing industry, it will be essential to have a large enough number of machines with rated output in excess of the maximum demand. In such cases it will be possible to shut down one or two machines in order to carry out the maintenance program. Often where continuity of service is absolutely essential, several internal combustion engines are held for stand-by service in case of power failure.

The day of the steam engine driven slow speed reciprocating compressors is rapidly drawing to a close. As overall operating efficiency and the space factor become more and more important, the electric motor drive established itself as the most practical prime mover. Nearly all of the new refrigeration plants are electric drive and many of the old steam engines have been replaced by space saving motors. These motors will give long years of trouble free service if properly selected, installed and maintained.

These three factors of proper selection, good installation and regular maintenance all contribute importantly to a long productive life for motors. That is the reason why all three will be covered in this article. For motors now in service the selection has been made. At any time however, faulty installation can be corrected and maintenance is a regular task regardless of the motor age.

Selection and Planning

For example, suppose we take up and view the considerations involved when increasing the capacity of an old plant or installing equipment in a new plant. The compressor manufacturer will determine the horsepower, torque and speed requirements to drive his compressor, and with the help and cooperation of a reliable motor manufacturer, will suggest the right size and type motor to handle the compressor or device that requires electric motor drive.

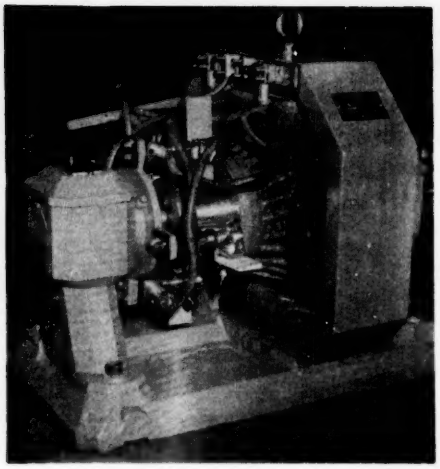
Since the power supply is one of the vital links in the system, your power supplier, whether a utility company or your own power plant engineers, must be consulted. They can determine the power line capacity available for starting a motor of the size required and possibly can help work out the best type of motor to use from a power supply standpoint.

In some localities there is a special power rate available for high power factor motors. Considered together with the higher operating efficiencies found in a high power factor motor, it may very well justify a somewhat higher first cost on the basis of a reduced operating cost. The utilities have completed their most pressing post-war generating expansion programs and very often full voltage starting will be allowed, especially on high voltage feeders. This makes possible a much smaller initial investment in starting equipment and starters which are simpler to maintain.

Remember when comparing efficiencies of large motors, a relatively small difference in efficiency percentage can mean a sizable power saving over a year of operation. The importance of selecting the correct motor to accomplish the job cannot be overestimated if you want minimum maintenance and operating costs.

Installation

Proper erection of the equipment to be used is the next basic step required to insure long life of the equipment. Be sure to inspect, for possible damage sustained during shipment to avoid misunderstanding later. Whether you or others set up the equipment it is essential that the chief engineer and at least his assistant, follow the work along in every step. A good operator knows every detail of his plant. Correct drawings should be on file and it is a good idea



This direct current veteran of the last century, by good care survived to give its original owner 38 years of service. Built in 1899 by Card Electric Co., forerunner of Ideal Electric, it ran like a youngster on a recent test. Note the pedestal bearing and the exposed connections. Copper gauge brushes were also used. There was one virtue of this design—dirt and dust on it were visible.

to frame under glass important operating instructions and hang them near the machine on which they apply. Every airline pilot uses a written check off list, even though operating his plane daily. Obviously it is important to you also to follow prescribed procedures. On many motors now operating, the drawings and other data have been lost. Now is better than later to check with the manufacturer and replace all possible data in the plant equipment file. Then further operation and maintenance will be greatly facilitated.

Start is important

Insist on having representatives present at the initial starting of component equipment in your system. It is a good time to go over drawings, study recommended operating procedures and listen to advice that may be offered. This applies also to that sometimes bewildering looking motor starter as well as compressors, pumps, piping, condensers, valves and other accessories. The erector should line up the air gaps on engine type motors between rotor and stator so that it is even on both sides and .010 in. narrower at the top than at the bottom.

This gives the magnetic circuit less reluctance at the top which results in a greater magnetic attraction between the stator and the top of the rotor. The upward force on the rotor relieves the weight on the bearings and allows the rotor to "float". The manufacturer takes care of rotor alignment on motors with frame mounted bearing support brackets, but it is still necessary that couplings and pulleys be pressed on "square" and properly aligned with the driven equipment.

Be sure enough ventilation is furnished in the motor room to remove the heat due to the motor inefficiency. In more familiar terms, if refrigeration were used to remove this heat, about .02 tons for each horsepower would be required. This would be one ton of refrigeration for a 50 hp motor. If motors have been placed in small non-ventilated places, steps should be taken to provide adequate air circulation before difficulties result.

It is also important to have the motor room as dry as possible. If it should be necessary to use water for cleaning, locate the drain so that the water will be drained away from the areas where the motors are installed.

Operating Records

There are two things in particular that should be noted before the equipment is put into regular use and the results recorded. These two things particularly apply to large size motors which are so essential to a system and are the hardest to replace in a short time: No. 1; the air gap measurements should be taken and recorded both at the top and bottom and both sides of the rotor after final alignment. No. 2; the insulation resistance measured with the motor cold by means of a megohmer. These will be discussed at greater length later. I mention them now only to emphasize their value in determining bearing wear and insulation breakdown. Obviously you must know the beginning values to make comparison later. If this information is not on file at present, then a beginning should be made now to compile it on a regular schedule. It is surprising how valuable just a few detailed records prove to be for checking operating and maintenance methods and motor condition.

Good Tools and Instruments

The following equipment, in addition to the usual assortment of machine tools, will be found very useful.

1—Megohmer or other insulation resistance measuring instrument.

2—AC Voltmeter with two "clip on" leads of equal length.

3—Two centigrade scale thermometers for accurate determination of motor heating. You can not determine accurately an overheated bearing by the feel of your hand. The centigrade scale will be found more convenient since the motor temperature guarantees are given in centigrade.

4—Air gap measuring gage.

5—AC Ammeter mounted on the starter is essential for installations where the load can be operated in such a way as to place abnormally heavy load on the motor. Full load name plate amperes should not be exceeded.

They say you can judge the horse's age by its teeth, but a motor's age is judged by its insulation. Proper insulation care is a typical example of how preventative maintenance can save big repair bills and improve motor service. The approximate cost for re-winding a stator is 33 percent of the list price of a new machine. For re-winding a rotor the cost is approximately 30 percent of the cost for a new machine.

Manufacturers are constantly working toward improving insulation and winding techniques. Wonderful results are being obtained on 600 volts and below by means of vinyl acetal (form of resin) coated wire instead of cotton covered enamel. This new insulation is tough, pliable, and heat resistant and is very resistant to insulating varnish solvents.

In large motors and those operating on high voltage, form wound coils are required. These are made up of a number of turns of double cotton covered square wire which undergo three to five cycles of wrapping with tape and varnish dips, with each cycle followed by a controlled period of baking. This insulation is known as Class A and is the most commonly used. The insulation can be modified by using different materials to meet special conditions of high temperature, high humidity, chemical atmosphere or the many other unusual conditions possible.

Regular Cleaning

The main enemies of insulation with which you will have to contend are heat, dirt and moisture. Motors today are becoming more and more

enclosed, which requires forced ventilation for cooling. The motor drives a self cooling fan and by means of baffles, cooling air is directed over the laminated iron core and the winding end turns. This constant movement of new air into the machine brings with it large amounts of dust particles which always seem to find a place to lodge within the motor. This dirt collection restricts free-air flow and results in overheating the coils and insulation.

Overheating tends to deteriorate insulation and dry out the varnish coating. The tiny cracks which result in the varnish allow moisture to make its way into the insulation and will eventually reduce the dielectric strength of the insulating material to such a point that a short or ground will result. Even without overheating the same general process takes place, only at a much slower rate. Frequent cleaning and occasional varnish spray coatings and observing load limitations, will very much prolong insulation life.

Check of Condition

The following are included to give information as to the safe insulation resistance level that should be maintained and to help in deciding when coil rewinding is necessary. The American Institute of Electric Engineers gives a general rule which recommends that the insulation resistance of a machine at its *rated temperature* must not be less than that given by the following formula:

$$\text{Insulation resistance in megohms} = \frac{\text{Voltage at terminals}}{\text{KVA rating} + 1000}$$

A megohm is a unit of electrical resistance equal to a million ohms. While this is only an arbitrary rule, in actual practice the insulation resistance, measured with the motor at room temperature, should be twice this value in order to insure against breakdowns. Table below gives some typical values.

EXAMPLES OF SAFE INSULATION VALUES

Machine Rating Volts	Kva	A.I.E.E. Standard Megohms
110	20	0.108
220	20	0.216
440	50	0.419
550	100	0.500
2200	100	2.000

Motor starters .500 Megohms
Commutators, field coils, armatures .750 Megohms.

Records of all insulation resistance measurements should be filed for future comparison. For example a 100 kva, 550 volt motor, may have an insulation resistance value of 0.7 megohms, while next year it might measure 0.4 megohms. This would indicate that the insulation has deteriorated below a safe level. As soon as convenient this motor should be taken out of service and baked thoroughly until a satisfactory insulation level has been reached, when a good coating of insulating varnish applied while the motor is still hot. This baking process may or may not rejuvenate the insulation, depending upon its condition. In interpreting measurements it is interesting to note that insulation values taken with a megohmer or as it is sometimes called a megger, are always 10 to 20 percent higher when a machine is cold than when a machine is hot.

Good care results in long life for people, airplanes and motors. The motor is a rather simple mechanism, once it is built. That is why so many people take its continuity of operation for granted. Not a great amount of work and expense is required to keep motors operating well through a long, useful life. Guides to follow in accomplishing such worthwhile results are detailed in this article.

The replacing of coils is out of the realm of maintenance and should be done by a reliable repair shop. In cases where a machine has been out of service for quite some time, as is the case with air-conditioning, a low voltage should be applied to the motor windings and the heat losses in the machine will dry out the insulation which increase its dielectric strength to a safe level.

Bearings

Every operator is familiar with the proper care of bearings since bearings are such an essential part of every machine. However, these procedures are often forgotten or observed carelessly. The new sealed-in-grease ball bearing which is being used by many of the manufacturers is a boon to maintenance men. Such bearings are used in NEMA frame sizes up to 200 hp.

There are a number of instances where these bearings have been in operation on a 24 hour a day basis for nearly 10 years. When examined there was no appreciable wear and it was decided that the original grease was in suitable condition for another three years operation. To large extent these bearings have eliminated the original hazards of: over-lubrication, under-lubrication, use of inferior lubricants, dirt applied with the lubricant and the danger to personnel involved in lubricating motors located in inaccessible places.

Removing Grease Seal

It should only be necessary to remove the grease seal for inspection every three years. Add grease of the specified type if required, so that the bearing is two-thirds full, then replace the seal. With this type of bearing, as with any other type, it is very important while handling the open bearing, that every precaution be taken to keep dirt, dust, or other foreign materials out of the bearing.

Bearings on large motors are usually of the babbit lined split type with ring oiling. It is wise to replace the oil in each bearing after the motor has been in operation about four weeks, this will flush any core sand or metal particles which may have worked loose. The oil level should be maintained between the high and low levels on the oil level gage. The amount of bearing wear can be gaged roughly by the change in the air gap if records are available on previous air gap measurements.

Bearing operating temperatures depend on the type of bearing and the manufacturer should be consulted for this as well as other temperature operating limits. In cases where the engine room is very hot the oil should be changed to a heavier weight to insure proper lubrication. The weight and type of oil used should conform to manufacturers specifications. A check should be made each time the motor is started to insure that the oil rings are turning and properly delivering oil to the bearing surface.

Rules for Working With Bearings

Below are listed a few of the common things to remember when working with bearings:

1—Work with clean tools and in clean surroundings.

2—Remove all outside dirt from the housing before exposing the bearings.

3—Handle with clean dry hands and wherever possible avoid touching any bearing contact areas.

4—Treat a used bearing as carefully as a new one.

5—Use clean solvents and flushing oils.

6—Lay bearings out on clean paper and cover them if they are not to be used for a time.

(Continued on page 58)

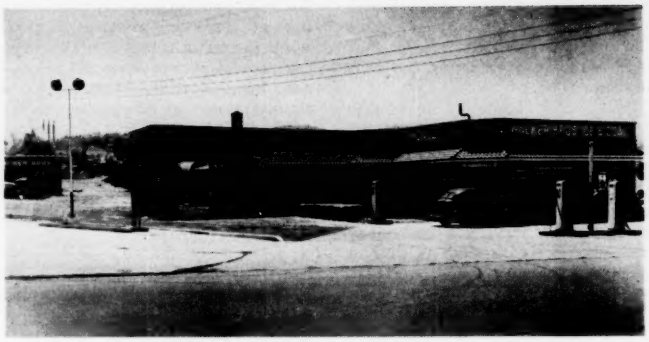
Good Housekeeping Increases Ice Plant Efficiency

JOHNSON CITY is at the eastern end of Tennessee between Virginia and North Carolina. It is in the mountains where water is commonly assumed to be abundant. Still a certain amount of money is involved in securing the water supply and this is especially true when city water is purchased for condensing purposes in an ice plant.

The Walker Bros. plant in Johnson City with a capacity of 20 tons had been operating on city water straight through a horizontal shell-and-tube condenser. There was a small well but it was not adequate for anything but make-up.

Recently it was decided to eliminate this purchase of city water purely for the heat units it could absorb. An evaporative condenser made by the Bush Manufacturing Co. was installed and C. E. Walker, owner of the business, reports the water consumption has dropped to only a fraction of the former figure. The well water supply is now adequate.

The plant features cleanliness and economy in its operations. Of modern design, it was erected in 1945. The company distributes petroleum products so the choice of oil engine drive was natural. The ice freezing tank of 280 can capacity was furnished by Enterprise Equipment Co. Since the plant was installed the tank tops have been carefully refinished each year with a porch paint which gives good service. This is important to plant appearance because tank tops usually are one of the least attractive features of the plant.



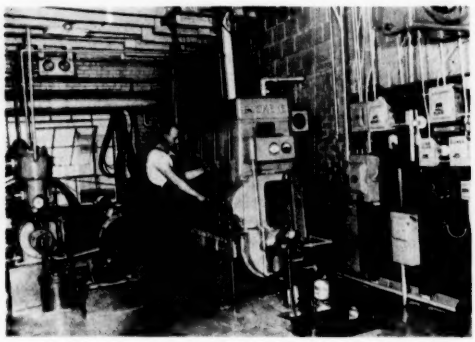
Front view of Walker Bros. Ice & Coal plant, Johnson City, Tenn.

The refrigeration side of the plant is composed of two York compressors: a 6½ inch high speed and a 7½ inch low speed machine. A Buckeye diesel engine of 100 hp drives the equipment. It furnishes good, economical power with a consumption of about 5.4 gal. of diesel oil per ton of ice made. Mr. Walker likes to attribute the low engine repairs to the use of good lubricating products and good care probably figures in for considerable credit.

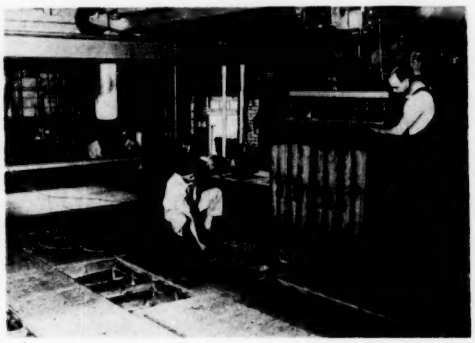
C. E. Walker, President

The photographs of the plant interior illustrate the good housekeeping practices. The inside of the plant is completely finished in gray paint with red trim. This is maintained by frequent renewal as needed. A good paint job does much to keep up appearances but more is required and this is supplied by constant attention to the housekeeping routine. On each shift the engineer is required to go over the plant completely and he, in turn, is responsible for maintaining good conditions and operation.

Good housekeeping includes most of the steps toward fire prevention such as eliminating any accumulation of combustible material and using waste containers. The plant is inspected regularly by the local fire department and an insurance inspector. Both have commended the good housekeeping and the fire prevention measures employed.



Interior of ice plant, showing the Diesel engine and compressors.



View in tank room. The excellent condition of the can covers is evident.

The left wall in this view of the Pasco Packing plant is erected against the older storage wall. The columns with the box-like insulation project through roof to serve as framework for the office above. The long cold air ducts extend along the ceiling toward the end of the room. It will be noted that open type wiring has been installed for the lights.

STORAGE FOR CONCENTRATE

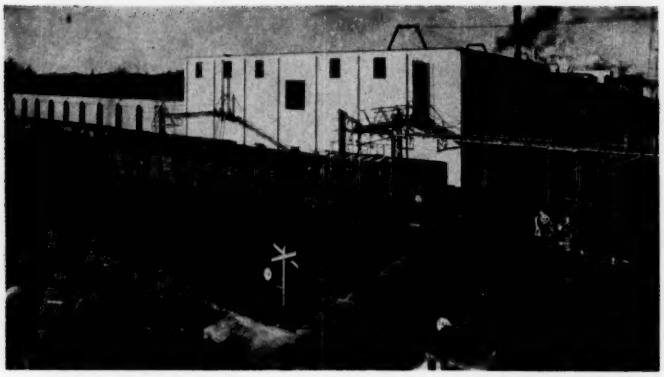
Freezer storage room for 800,000 cubic feet is included in new addition providing increased low temperature processing and storage capacity for Florida citrus packing concern.

SEVERAL large additions to their low temperature processing and storage equipment has been completed by the Pasco Packing Company, Dade City, Fla. Perhaps the most spectacular of these is the freezer storage which has more than 800,000 cubic feet of -15 F space in a single room. This new freezer is an important facility in the expanding operations of the Pasco plant in citrus juice concentrate.

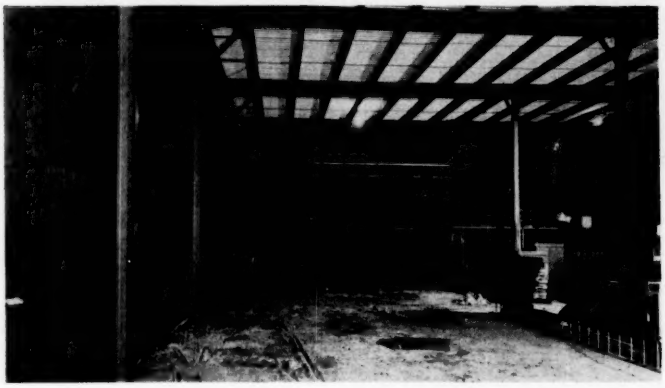
Details of this storage are shown in the illustrations. It is 190 ft. by 200 ft. by 22 ft. high and is designed for mass handling and piling of goods which is typical in large canning and processing plants. An earlier freezer storage adjoining the new one is 138 ft. by 151 ft. by 22 ft. high. Together they provide total space of about 1,300,000 cu. ft.

The Pasco Packing Company has been a large packer, canner and processor of citrus fruit and its products. A rapidly expanding section of their business is the production of frozen orange juice concentrate. During the current citrus season they expect to reach a peak production of 60,000 gallons of concentrate per day. Furnished by A. T. Lohkamp, steam and refrigeration engineer, this article presents interesting details about the Pasco plant facilities.

Citrus juice concentrate is a relatively new portion of the plant operations although it now bulks large as an individual product. The plant includes the following products in its output: canned citrus juice, grapefruit sections, grapefruit and orange salad, and the concentrates, both hot pack and frozen. By-products of the citrus processing are peel oil, feed and molasses, dried pulp and peel for cow feed, and dried seed from which oil is extracted.



The cold storage rooms appear at the left along the siding of the Atlantic Coast Line Railroad in this general view of a portion of the large Pasco plant. Mass handling of new cans is provided by the elevators from the cars on siding to the plant. Formerly the building at the center had the juice concentrate closing-out and freezing facilities on the top floor but this has been moved to the ground floor of the new plant.



The huge new room to store juice concentrate at –15 F is shown under construction. The corkboard insulation was furnished and installed by the Armstrong Cork Co. In this photo the wall insulation is being placed and the corrugated ceiling deck is visible.

A view in the completed room shows the floor type, forced draft refrigeration unit along the right wall with the distribution ducts extending across the ceiling to the left. The refrigerant pipes running the length of the right wall served the freezing process equipment before the room was erected and this accounts for the insulated piping in a –15 F. room.

Refrigeration Facilities Expanded

As a part of the same expansion, additions were made to the low temperature refrigeration facilities. These include a 15 x 10 booster and a 10 x 10 high pressure compressor — both York ammonia machines. They are driven by Ideal synchronous motors at 327 and 300 rpm respectively. With these additions the refrigeration capacity was increased to 312 tons at zero pounds suction pressure.

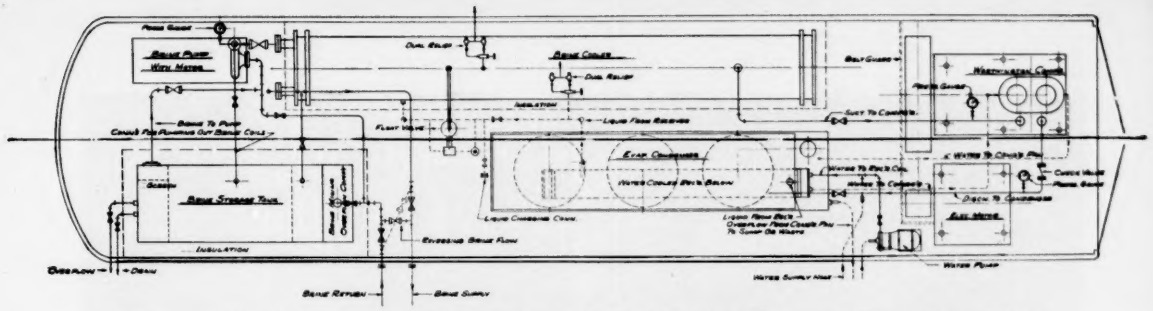
For the current production season further expansion of the frozen concentrate facilities will enable Pasco to make 60,000 gallons of 42 degree Brix concentrate a day. For the freezing tunnel, they are installing a Carrier centrifugal refrigerating machine of 232 tons capacity to chill brine to -30 F for freezing the concentrate prior to entering the -15 F storage rooms. Also being added to the ammonia cycle of this section of refrigerating plant is a 5¾ x 8 V-W type York ammonia compressor.

The centrifugal unit is designed to operate with 86 F condensing water. This will permit use of the cooling water through the ammonia condensers first and then it will pass through the condenser on the centrifugal refrigeration unit which employs Freon 12 as a refrigerant.

Steam Requirements

The plant has large steam requirements for power generation and product processing. It operates four boilers with total steam production of 245,000 pounds per hour. Some 40 percent of the turbo generating equipment exhausts the steam at 45 psig for process use. Flexability in operation is obtained by having duplex turbine and electric motor drive on many of the power plant auxiliaries. Some of these turbines will exhaust at either 5 psig for boiler feed water preheating or 45 psig to make up process steam requirements that cannot be satisfied by the exhaust from the non-condensing turbine. In this way adequate process steam is always available without taking any steam directly from the boilers through the reducing valve to provide for processing needs. This is a definite advantage of economy.

Further economy is assured by making use of waste heat of the boiler blowdown water. Also water discharge from the turbine condenser is used for supply to the water softener. Thus instead of using water from deep wells at 74 F, the water softener draws its supply at 100 F. from the turbine condenser.



Arrangement of the refrigerating equipment for the portable ice rink. All this equipment to serve a 40 by 60 ft. rink is accommodated on a single trailer and for operation requires only a power supply and a ¾ in. water supply line

SKATING ON ICE IN SUMMER

Ice varieties, one of the big attractions at the Chicago Fairs of 1949 and 1950 shows skating on real ice under a blazing sun. Designed by refrigeration engineers

L. F. CLIFFORD

THE show must go on—even when it means maintaining 32 degree ice under a blazing sun and the temperature in the shade is 100 F. With no shade around, skaters performed all summer long on a mirror of ice under these and other unfavorable conditions at the lake front fair in Chicago.

Last year it was called the Railroad Fair and this year it was the Chicago Fair, but both years found the Voorhees-Fleckles Ice Varieties one of the big attractions. And when this meant shows all afternoon and evening under all weather conditions credit goes to the ice making equipment as well as to the performers.

Of course the performers were some of the best in ice show business. There's Ronny Roberts for example. He looks like he's in his early twenties, but he has been in show business for 22 years. He started his career in circus work and appeared with the Flying Fishers in a trapeze act.

For the past 10 years, Ronny Roberts and his wife have been skating together in ice shows. Their appearances include seven years at the Hotel New Yorker, two years at the Worlds Fair in New York, engagements at the Center Theater, and with Shipstead and Johnson's Ice Follies. They were starred in an adagio number at the Chicago fairs.

It was while Ronny was touring Europe with ice shows that he learned refrigeration so he could keep the equipment running when service engineers weren't available.

He has supervised and assisted in setting up portable rinks, getting the refrigeration equipment running so it would make ice, purging air out of the refrigeration system and brine pipes, adding oil to the compressor crankcase and draining it out of the oil trap, adjusting manual valves, and getting the electric controls and power circuits in operation.

Engineers Plan Rink

Before the rink was built in Chicago for the fairs, Reginald Voorhees and L. N. Fleckles with their background of ice show experience conferred with the design engineers at Buildice Co. Plans were drawn, and construction started.

The result is believed to be the first rink for public outdoor shows in a permanent location. All equipment is semi-portable, however, in case it is ever necessary to move to another site.

The ice rink is 24 by 40 ft. and the ice is maintained at a depth of 4½ in. Usual operation is to make ice during the night. This allows for 1 to 1¼ in. of ice meltage during the heat of the day.

There was a rain last season, though, when there was a leak in the canopy which was put up at night to protect the ice. Rainwater ran into the rink and filled it to the top of the curbing. By morning it had frozen into 7½ in. of ice. It took several days for the top ice to melt and the water to drain off until the ice got back down to 4½ in. Faster melting would have impaired the quality of all the ice in the rink. The rink is designed so that water will drain off, leaving a smooth, fast sheet of ice at all times.

The base of the rink is composed of four inch cork board insulation. This was covered with a three-ply water-proof membrane over which was laid reflective type insulation.

Floor grids were shop welded from 7,680 linear ft. of one in. O.D. seamless steel tubing. There are 40 grids each with five pipes on 2½ in. centers. Each grid is 10 in. wide and 24 ft. long.

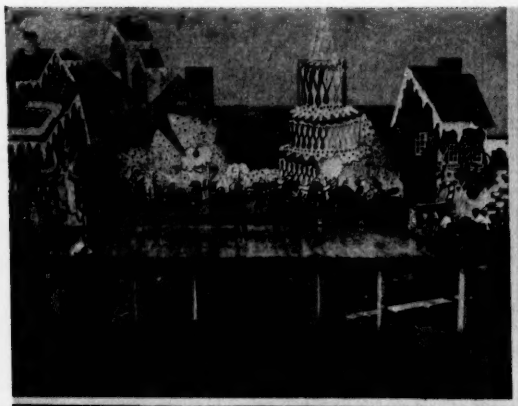
The floor grids were laid on the insulated water-proof base and sand was filled in to cover them and give ¼ in. protection. The grids were connected to the 4 inch supply and return headers with rubber hose to allow for expansion and contraction.

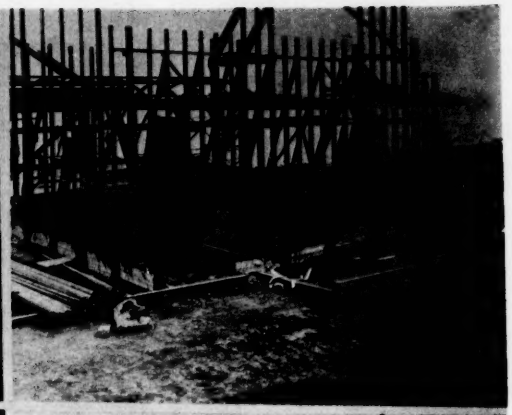
Through these grids, calcium chloride brine is circulated by two continuously operating centrifugal pumps. Each pump has a capacity of 90 gpm. The brine is cooled in a horizontal dry expansion type brine cooler.

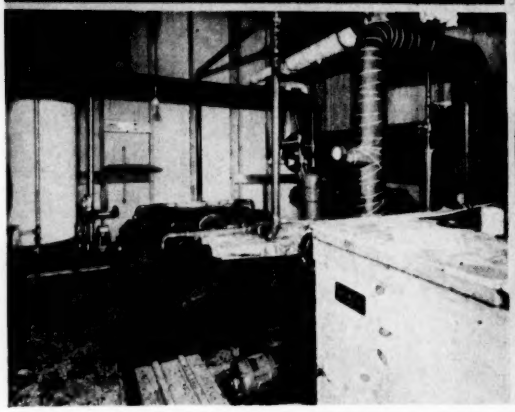
Refrigeration System

The Freon refrigeration system consists of two 25 hp G.E. motors driving four Curtis compressors. Included are oil separators, liquid receiver, and a shell and tube multipass condenser. Water from nearby Lake Michigan is used for condensing purposes. The condenser water pump starts and stops automatically, independent of the operation of the compressors.

The plant is completely automatic in its operation, maintaining a brine temperature of 8 F. When the brine drops below 8 F, both machines stop. One machine starts when the brine temperature rises above 10 F, and the







Top Left: The cast lines up on the outdoor ice rink at the Chicago Fair. Although they give the ice hard service every day in the summer it is maintained in good skating condition by liberal piping ratio, 1 in. pipe on 2½ in. centers and a brine temperature of 8 to 10 F.

Bottom Left: Interior of the machine room for the ice rink shows the refrigerating compressors, brine cooler and brine tank

Top Right: Construction of the rink has proceeded to the placing of the brine tube grid and the curbing around the rink. Although insulated below with only 4 in. of corkboard there was no frost heaving in 3 months operation with brine at 8-10 F.

Bottom Right: The portable ice rink, 40 by 60 ft. is being set up for a show. The trailer in the right background carries the complete refrigeration equipment for a skating rink

other machine cuts in when the brine reaches 11 F.

Not one ice show was missed either year because of equipment failure or poor ice.

Other Portable Rinks

Voorhees-Fleckles have two other ice shows. One plays a carnival circuit and has a portable rink 12 ft. square. The refrigeration system for this rink has a five hp motor driving the compressor.

The other rink, also portable, is 40 by 60 ft. It has been used for ice shows all over the U. S. The refrigeration equipment for this rink is mounted in a trailer truck. The system includes an 8 x 8 Worthington ammonia compressor driven by a 75 hp motor.

There is also an evaporative condenser, a combination shell and tube liquid cooler and liquid receiver, a shell and tube brine cooler and brine storage tank, and brine circulating pumps. The only connections necessary are ¾ in. condenser water lines, power lines, and three-in. rubber hose mains to circulate brine to the rink.

The rink has 15,000 ft. of ¾ in. standard weight black steel pipe arranged in 102 coil banks. Each bank is seven pipes across and measures 12 in. by 20 ft. long. The grids are connected together, and also to the supply and return headers, with flexible rubber hose having quick opening connectors. The headers are built in 20 ft. lengths with steel flanges for bolting together.

The entire rink can be taken up and packed on trailer trucks in four or five hours. To completely set up and freeze a sheet of ice takes 8 to 10 hours. The plant is run to make ice both day and night to speed up production for short engagements. This rink also has a canvas cover to protect the ice from sun and rain.

These rinks appear to refute the earlier impression that it was not possible to operate ice skating rinks in the summer except under special conditions. These productions take things as they are and put on a good show anywhere.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Executive Offices
1706 L St. N. W., Washington, D.C.

Executive Secretary
Mount Taylor, Washington, D.C.

President
H. O. McLain, Chicago, Ill.

First Vice-president
E. F. Condon, Los Angeles, Calif.

Second Vice-president
Wm. J. Ayers, Memphis, Tenn.

Treasurer
Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

A fund raising campaign is being launched for National Ice Advertising, based on letters to be written by leading ice men to other ice men in their state. Although the levy has been reduced this year, an outstanding program is promised.

The new Social Security Act has made some changes, among which is one excluding ice driver salesmen, except those in full time employment.

Two federal courts have declared invalid the so-called "patent" on sized ice in suits heard in Baltimore, Md. and Dallas, Texas.

A joint merchandising program has been established by a group of New England ice companies with offices in Providence, R. I. A full line of ice-using appliances will be sold.

A Florida ice company has established a profitable business providing crushed ice and other services for trucks hauling vegetables from Florida.

The annual convention of the Florida Ice Association was held at the Columbus Hotel, Miami, Fla. October 9 and 10. An interesting program was presented and a good time was had by all.

Letters From Ice Men Solicit Funds for Public Relations

THE campaign for public relations funds (National Ice Advertising) is now under way by the National Association of Ice Industries. The Finance Committee decided to do something entirely different this year and this resulted in launching a fund raising program based on letters to be written to all ice men by leading ice manufacturers and distributors in their state.

Letters have been written to these leading ice men asking them to write to all others in their state in behalf of the public relations program of the ice industry. What they are trying to do, it is explained, is to reach every ice man in the United States in the shortest time possible and it is suggested that this plan will more nearly accomplish that purpose than the usual stereotyped campaign procedure.

Levy is Reduced

It is further explained that the executive committee of the association at its recent meeting in recognition of the difficulties encountered by the ice men, reduced the levy for the 1950-51 public relations program by 50 per cent. The new campaign for funds is based on 1½ cents per ton on 1949 sales as compared to three cents per ton last year.

In spite of the reduced levy, however, the industry is assured of an outstanding program during 1951. The expenditures for advertising space and publicity will not be cut in proportion to the reduction in the levy, and it is conceivable that the new levy may bring in enough additional support to raise as much money as the present levy. By careful operation in the past, the condition of the treasury will permit of this gamble for at least the one year.

Enclosed with this letter are a number of printed folders and a list of ice companies in that state. To each of these ice companies a letter with an accompanying folder is to be mailed. The folder also will have five other names typed in, leaving the signature lines blank. As many letters may be written as desired but in any event, enough letters should be started to cover every name on the enclosed industry list at least once. In this way every member of the industry will receive at least one folder. When the folder is returned, it is to be forwarded to the National Association offices and they, in turn, will mail a pledge card to each company that has signed. This idea, it is expected, will bring results if all the leading or key ice men who have been chosen in the various states will follow through.

The four-page folder enclosed with each letter points out that the ice industry is going to have a National advertising and publicity program in 1951 but how extensive it will be will depend entirely on the individual members of the industry.

The folder concludes with the statement that only a united industry will bring about a successful campaign. It takes big companies and small from the north, south, east and west. It is now easier and more economical for all ice men to take part in the progressive public relations program of the industry. The chain of participating ice companies is already strong. The point is each individual ice company can add a link and make it stronger.

Here's What Is Planned For 1951 Ice Advertising

A big advertising program—selling more ice to more people—in top national magazines.

A forceful, ice-selling commercial campaign in leading trade publications.

An intensive public relations effort among editors of newspapers, consumer and trade magazines, and radio TV stations to publicize all uses of ice.

Exhibits at national conventions of other groups whose members are purchasers of ice.

New Social Security Law Establishes Status of Ice Dealers Peddlers

ON JANUARY 1, 1951 a new Social Security Act, as amended, becomes effective. The new act differs in many respects from the existing law. Stated briefly, perhaps the most significant changes to the ice industry as listed in a bulletin issued by the National Association of Ice Industries are:

1—Coverage is expanded
2—The tax base is raised and the tax rates are increased
3—Benefits are increased
4—Eligibility is made easier
5—New definition of "employee."

Approximately 10,000,000 additional workers, including most self-employed (in business for themselves), will be taken into the system. This expanded coverage is important to the ice industry for the reason that for the first time the "self-employed" category embraces sole proprietors and partners. These persons should obtain a social security number from their nearest social security office. Officers of corporations have always been included.

The tax base on which payments must be paid into social security by both employee and employer is raised from $3000 to $3600. The tax rates that each must pay on this first $3600 of income are:

1950-1955: 1½ percent
1956-1959: 2
1960-1964: 2½
1965-1969: 3
After 1969: 3¼

For "self-employed" the base is also $3600 but the tax rates are:

1951-1955: 2¼ percent
1956-1959: 3
1960-1964: 3¾
1965-1969: 4½
After 1969: 4⅞

Concerning further the "self-employed", numerous deductions and adjustments are allowable. It is suggested that these persons consult with their local social security office regarding their individual situations.

For a large segment of the ice industry the definition of the term "employee" has been troublesome, particularly with respect to driver-salesmen, route deliverymen or commission-drivers engaged in the sale and distribution of ice. The new law seems to solve this problem through the spelling out in more clear-cut language the meaning of the term "employee."

In addition to retaining the language of the present law wherein the usual common law rules are applicable in determining an employer-employee relationship, the new law provides that the term "employee" means "an agent-driver or commission-driver engaged in distributing meat products, bakery products; or laundry or dry-cleaning services; or as a full time life insurance salesman; . . ."

Driver Salesmen Excluded

As ice driver salesmen are not included in the foregoing list, it appears safe to conclude that they are excluded from coverage; except, of course, those in full time employment and control of ice companies. Since the statute by its own definitions specifies those persons to be covered, all others not so specified are excluded. Because of this important change in the definition of the term "employee," the previous uncertainty for many ice companies should be eliminated when the new law goes into effect.

Hetzler Ice Business Sold

THE good will and business of the 78-year-old Hetzler Bros. Ice Company, Rochester, N. Y., has been sold to Rochester Ice Inc. The land, buildings and ice-manufacturing plant will be sold separately.

Originally established by George Hetzler, the business was carried on by three sons, Frank, John and Leo, until after the death of Frank, when Leo became head of the company and operated it for many years. Following his death in April, 1949, his wife, Catherine S. Hetzler, became president and treasurer; Joseph Stokes, first vice president and secretary, and Mrs. Elizabeth Stokes, second vice president.

William J. Lewis Jr., president of Rochester Ice, said the six Hetzler driver-salesmen had joined his organization and the business would be operated from his Canterbury Road

Flyers Drop Ice On Troops

AMERICAN flyers in Korea unable to drop water to one isolated British company on the Korean war front southwest of Taegu, parachuted blocks of ice to the Tommies. One airman said: "They'll melt it down while brewing their tea."

Trial of Ice Companies Delayed by Debate

TRIAL of several southern ice companies and two company officials on federal antitrust charges, bogged down in legal arguments soon after it opened in U. S. District Court at Macon, Ga., October 4. The government has criminal or civil actions or both pending in the Middle Georgia District Federal Court against a number of ice companies and ice company officials charged with violating the Sherman Antitrust Act in connection with the sale and distribution of ice, as reported in the June issue of ICE AND REFRIGERATION.

Earl A. Jinkinson, chief of the Justice Department Antitrust Division's Southern office objected to statements by General H. D. Russell for the defense and the jury was removed while opposing counsel argued legal matters for more than two hours. Jinkinson objected to Russell's statements about reasons for some of the defendant's actions which he said should not be admitted as evidence later in the case.

Russell argued the matters should be allowed and insisted upon his right to discuss them in the opening statement—an outline of what the lawyers expect to prove with evidence during the course of the trial.

Previously the taking of depositions in the suit was temporarily delayed by Judge Frank A. Hooper in district federal court at Atlanta, Ga., pending a ruling by Judge T. Loyt Davis of Macon before whom the case was pending. Judge Hooper refused to make a ruling on the ground that the question was a matter for Judge Davis to decide.

The Justice Department's attorney asked the court to permanently enjoin depositions scheduled for the defendant companies. He charged that they were trying to cross-examine government witnesses and take from the government its right of surprise in the criminal case. He contended that if the government secured a conviction in the criminal case, it would serve as prima facie evidence in the civil case and make a second trial unnecessary.

Robert B. Troutman, chief counsel for the defendants, declared that the government had no right to insist on trial of the criminal case first. He charged that the government had seized more than 9,000 records of the defendant companies, had sent them to Jacksonville and kept them four months, and had been "almost tyrannical" in denying the defendants the right to question witnesses who appeared before the grand jury.

Sized Ice Patents Held Invalid by Federal Courts in Baltimore and Dallas

THE following bulletin issued by Gen. P. A. Weatherred of the Southwestern Ice Manufacturers Association gives full details of the suits on patents on sized ice.

Details of Suits

In 1938 the Patent Office granted to one Orrison a patent on the processing and the end product of sized ice. After some feeble effort at enforcement, the patent lay more or less dormant until 1949 when a seriously prosecuted suit was brought against the Hoffberger Ice Company in Baltimore, Md. In June, 1950, suit was filed in Texas against the Bateman Foundry and Machine Company of Mineral Wells, and against Hugh Drane Ice Factories, Inc., and J. Wesley Edens, Sr. and Jr., of Corsicana, for infringements. The cases in Baltimore and in Texas were prosecuted by competent counsel and supported by what appeared to be abundant financial resources.

The attorneys for the patentees stated more or less openly that they expected to exact one and one-half million dollars per year in license fees from the ice industry. Should the patent be upheld, the law will permit only those to size and sell sized ice who may be licensed to do so by the patentees, who would determine the license fees. The patentees would possess a monopoly on sized ice and could extend their monopoly in each market to those they should see fit to designate as licensees. Patentees could lay down conditions under which sized ice could be processed and sold.

As inconceivable as such results may appear to the layman, nevertheless the issuance of the patent carries presumption of its validity. The major defense in the Baltimore and the Texas cases had to be that more than two years prior to the filing date of the application for the patent, ice had been sized and sold to the general public. Hence it was necessary that documentary evidence be developed that would show beyond a reasonable doubt the processing and selling of sized ice prior to the year 1936.

Therefore to defeat this extremely critical threat to the ice industry it was necessary that such prior use be proved. Under the law, evidence of prior use is not admissible unless it is supported by documentary proof. The chief counsel in the Baltimore case was Charles M. Thomas, a distinguished patent attorney of Washington, D. C. Under the intelligent and painstaking direction of Mr. Thomas, evidence was prepared and presented in the Baltimore case that established prior use in Columbus, Ohio, in Washington, D. C., in Baltimore, and in Syracuse, New York. Reports are somewhat in conflict as to the weight the court gave in the Baltimore case to the Washington, Baltimore and Syracuse instances of prior use.

IN SUITS of Orrison et al against ice companies in Baltimore, Md., and in Texas, federal district courts rendered decisions in favor of the defendants, declaring the co-called patents invalid. The plaintiff group had alleged infringement of patent issued in 1938 on sized ice.

In Baltimore the court announced its decision in early October, the opinion being rendered in oral form with the announcement that it later would be issued as a written decision. This suit had been filed against the C. Hoffberger Co.

In Texas a decision was rendered by Federal Judge Atwell of Dallas that the patentees were not entitled to a monopoly in the sizing of ice and that they had invented nothing new. This suit had been filed against the Bateman Foundry & Machine Co. of Mineral Wells and Hugh Drane Ice Factories Inc. and J. Wesley Edens Sr. and Jr. of Corsicana.

The Baltimore case was tried during the week beginning September 25, 1950. After a lengthy and hotly contested trial, the court held that the patent was invalid primarily because of the establishment of prior use. Motion has been made for a new trial of the Baltimore case and attorneys for the plaintiffs have stated that it is their intention to appeal that decision.

The Texas Case

The Texas case came on for trial on Friday, October 13, before Judge Atwell in the Federal District Court at Dallas. The chief counsel for defendants in the Texas case was S. Austin Wier, a patent attorney of Dallas. In the preparation for the Dallas case, Mr. Wier had made two trips to Washington and Baltimore and one trip to Columbus, Ohio. He had depositions taken in Los Angeles, Calif., in Columbus, and in Washington. Through stipulation of opposing counsel, part of the evidence used in the Baltimore case was utilized in the Dallas case.

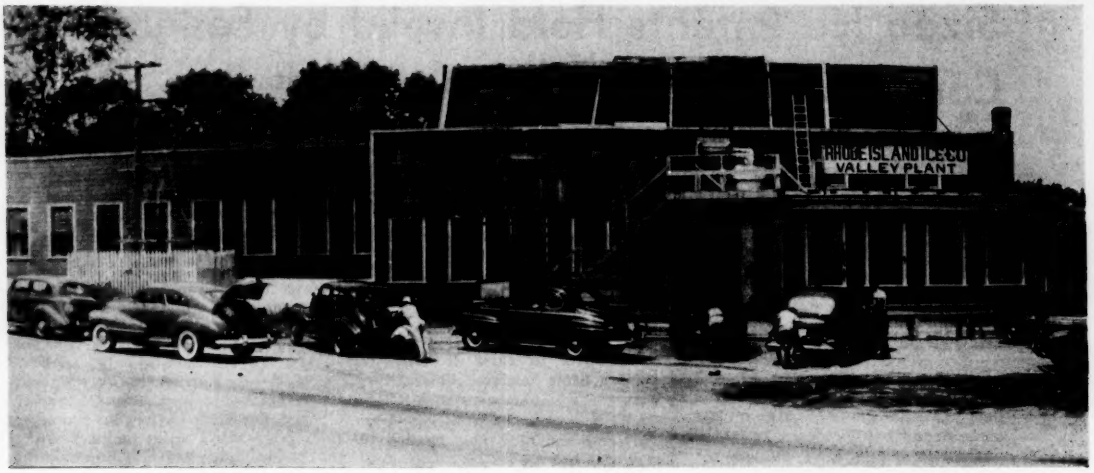
In the Dallas case the patentees endeavored to prove that Orrison invented the process of sizing ice and did this in Washington in 1935. Patentees claimed that through the process invented by them, cracked ice was separated into different sizes and was made free of snow, the result being a clear, free-flowing product.

Contention of defendants, very ably and effectively presented by Mr. Wier, was that patentees had invented nothing new; that the apparatus used for sizing ice had been used for a great many years in the sizing of coal, sand and gravel and many other products; that the crushing or cracking of ice was practically as old as the ice industry itself; that the mere separation of different sizes of ice was not a patentable process; that prior to 1936 the identical process described in the Orrison patent had been utilized in the ice industry specifically in Washington, D. C., in Baltimore, in Syracuse, N. Y., and in Los Angeles, Calif. Through the efforts of Mr. Wier and his associates, abundant and documented proof was presented by depositions and by witnesses in person who came to Dallas for the trial from Washington and from Columbus.

At the end of a hotly contested trial, Judge Atwell, on October 14, rendered a clean-cut decision holding that the patentees were not entitled to establishment of a monopoly over the ice industry in the sizing and selling of ice; that they had invented nothing new; and that specifically prior use had been established in Washington, D. C., in Syracuse, N. Y., in Columbus, Ohio, and Los Angeles, Calif.

Last report from counsel for the patentees was that it was their intention to appeal both the Baltimore and the Dallas cases. Counsel for the patentees also stated that they intend to bring a suit in each of the eight districts of the federal circuit courts of appeal in addition to the three suits they have filed in the District of Columbia; in Baltimore, Md.; and in Texas.

A third suit was brought in the District of Columbia against Mount Taylor for $200,000. The basis of this suit is that in August, 1938, as Executive Secretary of the National Association of Ice Industries, Mount Taylor distributed to the ice industry a circular enclosing copy of attorney's opinion, which opinion was to the effect that the Orrison patent was invalid. This case has not yet been tried but probably will be within the next few weeks.



Valley plant of Rhode Island Ice Company, Providence, R. I. Left are the engine room, truck icing station and office.

JOINT MERCHANDISING PROGRAM

Three New England ice companies open retail sales and show room where ice using appliances are sold and delivery salesmen trained in modern selling methods.

BELIEVING that the ice industry is still a live and productive business, three of the large ice manufacturers of Rhode Island; Walter B. Chaffee Ice Co., Rhode Island Ice Co., and George R. Holmes Ice Co., have joined in a merchandising program with a retail sales and show room at 87 Winter Street at Broad in Providence, R. I.

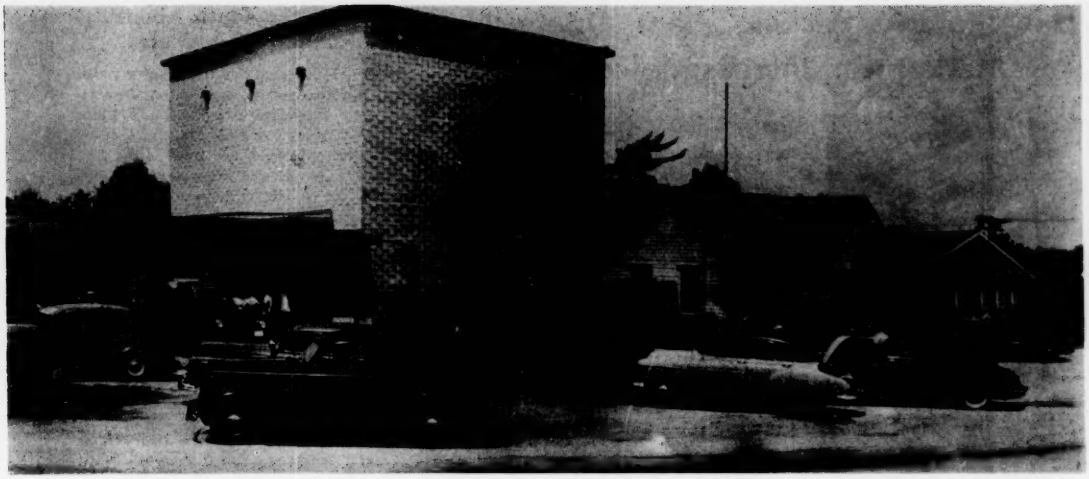
At this store, the I. C. E. Sales Co., ice using equipment, both domestic and commercial, and electric and gas appliances are on display. Snackmasters, water coolers, ice cubes, refrigerators, stoves, heaters and washers are among the many products sold here. Toridheet oil burners are also on display, being sold through the Rhode Island Ice Co. which is the sole state distributor.

Front view and window display, main sales room of I.C.E. Sales Co.

Brings Favorable Comment

The I. C. E. Sales Co., which was opened August 16, has brought continuous and favorable comment. The opening of the store was announced in the daily newspaper with two news stories following. Since September 8 radio has been the medium of publicity. The broadcasts, which consist of two spot announcements a day, five days a week, have brought many inquires.

The individuals behind this forward step are Walter Chaffee of the Chaffee Ice Co. with plants in East Providence, Barrington and Martha's Vineyard as well as stations in Falmouth, Wood Hole and New Bedford; John Orpen and Ray Wilber of the Rhode Island Ice Co. with plants in Providence, Woonsocket and Fall River; and George Breen of the George R. Holmes Co. in Providence. Also on the staff are Harry and Dorothy Herman, on commercial and store sales respectively.



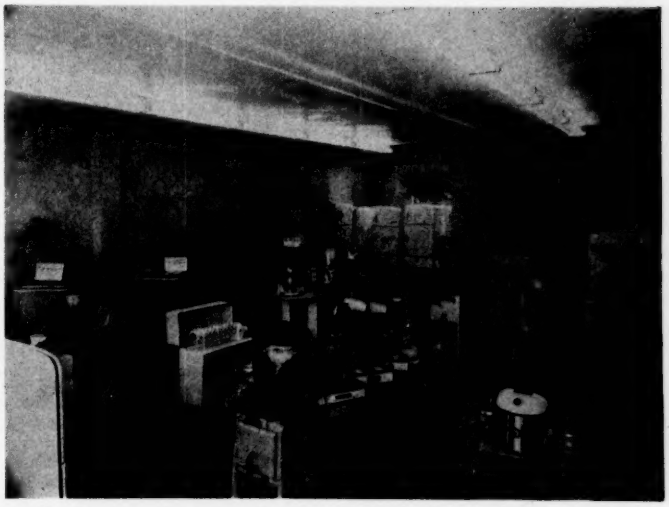
At the right are the branch I.C.E. sales room and filling station. The cars in front show activities of this busy place.

Meetings for Employees

Each company is now planning a meeting for its employees to tell them the story of present and future plans from the standpoint of both the individual and joint programs. The Rhode Island Ice Co., which has already held its meeting, has explained to its employees that they will receive a commission on any article valued over $50 sold from the store when a sale develops from a lead turned in by the employee. In addition they are offered a commission on new ice and oil accounts. These companies also plan to open branch show rooms at certain of the plants where locations and conditions warrant.

A picture of the Valley plant of the Rhode Island Ice Co. is shown above. A new icing station put into operation this summer, is located on the main highway passing through Providence from Connecticut to Boston. With an ideal location for truck drivers this station has done a large volume of business.

Ice company personnel backing the I.C.E. Sales Company. W. B. Chaffee, W. B. Chaffee Ice Co. and president I.C.E. Sales Co.; John Orpen, president Rhode Island Ice Co.; George Breen, George R. Holmes Ice Co., and vice-president and treasurer I.C.E. Sales Co.; Harry Fischer, oil burner division, Rhode Island Ice Co.; Dorothy Herman, manager I.C.E. sales store; Ray Wilber, vice-president Rhode Island Ice Co. and secretary-treasurer I.C.E. Sales Co.



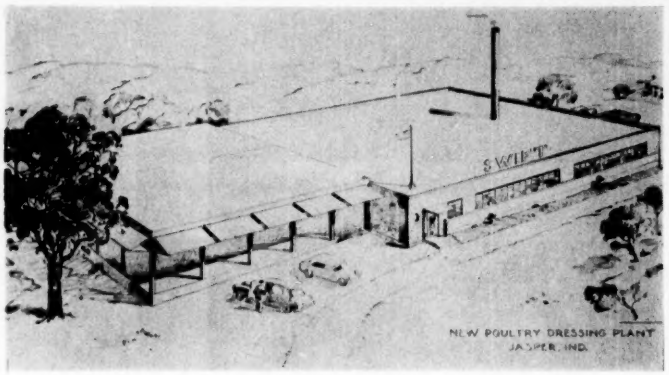
Display of ice using appliances, main sales room opened by I.C.E. Sales Company in Providence, Rhode Island.

Army Will Buy Ice

WORD received from Washington indicates that the army does not plan to build ice plants in reactivated army camps or barracks if ice can be obtained from local ice companies at reasonable prices. Information from the Office of the Chief of Engineers is to the effect that this decision is based on careful cost analyses in a number of installations, all of which show it to be more economical to buy ice from commercial sources rather than manufacturing it in army ice plants.

New Poultry Packing Plant Opens New Market for Increased Ice Sales

CONSTRUCTION of a new Swift & Company poultry processing plant at Jasper, Ind., should result in increased fresh ice sales throughout nearby midwest states where products from the plant will be marketed, O. E. Droege, head of the company's dairy and poultry department has reported.



Architects drawing of new poultry packing plant of Swift & Co. at Jasper, Ind.

The new Jasper plant now will make it possible for Swift to distribute ice packed poultry on a large volume basis in this area, Droege said. Birds processed at the plant will be packed and shipped in crushed ice as well as sold from fresh ice displays in retail food stores.

Swift expects to begin operating in Jasper late this fall and eventually will use approximately 30 tons of fresh ice daily at the plant. When running at capacity, approximately 25,000 birds will be handled each day.

Housed in a large, one-story brick and tile building, the new unit will feature a continuous line processing installation. Because no mechanical refrigeration will be used in the operation, the birds will be dressed, packed and shipped the same day. Facilities for ice chilling, ice packing and holding poultry ready for shipment will take up more than 20 per cent of the total plant area.

The birds will move by conveyor through a dressing and eviscerating line approximately 500 feet long. They then will go into vats of crushed ice and water to reduce temperatures to near-freezing, remaining there approximately two hours. After leaving the chill vats, the birds will be packed in crushed ice, shipped the same day and delivered at retail food stores the following morning.

Swift has been a pioneer in the marketing of ice packed poultry and now operates more than 20 plants similar to the one being built in Jasper throughout the nation. Mr. Droege pointed out that scientific poultry raising and processing methods developed during recent years now make it possible to market fresh poultry 52 weeks a year in most U. S. areas. This has resulted in a considerable increase in poultry consumed in the U. S. and has opened a new sales market for the ice industry.

Wissing Leaves Ebner

CLEM B. WISSING, secretary and sales manager of the Ebner Ice & Cold Storage Co., Vincennes, Ind., for many years has resigned from that company, effective September 30. He will devote full time to the distribution of Permutit water softeners made by the Permutit Co. of New York. His territory will be a sizable portion of southern Indiana, with headquarters and office at 702 North Sixth Street, Vincennes.

Delivers Ice 42 Years Then Takes Vacation

CUSTOMERS in Okmulgee, Okla., will miss Lee Forbes, iceman, who is taking an extended vacation because of ill health. He has been an employee of the Peoples Ice Co. and has delivered ice in the business district since 1908 when he first started working for the company.

Telling the Truth About Automatic Ice Makers

A FOUR page circular on automatic ice makers is being mailed to every conceivable ice user in their territory by the Seaboard Service of Neptune, N. J. D. Kruman, secretary and treasurer of Seaboard says while it is very difficult to measure the effectiveness of such literature they feel that any constructive attempt based on truth and fact and properly presented to the public will in the long run maintain tonnage that would otherwise be lost to mechanical substitutes.

The first page of the circular is titled "What's the Truth About Automatic Ice Makers," with the following facts: "Unless the ice you use in your business is Pure, Crystal Clear, Odor and Tastefree, Hard Frozen, Slow Melting . . . It may cause loss of business."

Inside, illustrated with cubes of ice in glasses, the following are listed as advantages of Seaboard's ice cubes.

Advantages of Ice Cubes

1—Because Seaboard's ice cubes are perfect in size, have greater density and are solid, they last 50 percent longer in drinks. People enjoy cold, flavorful drinks and will order more rounds an evening, if they are good.

2—Fast melting cubes mean two things to the slow drinker; his already diluted highball becomes rapidly more diluted, and he ends up with a watery, flat, iceless drink.

3—Most dispensers using Seaboard's cubes put two cubes in a glass. Their drinks are uniform in cost and taste. When "holey" cubes are used, there is no uniformity in strength or cost because the dispenser has no way of checking the size of the hold or pieces used.

4—All ice cubes melt some in storage. Seaboard's solid cubes melt only on the outside surface. "Holey" cubes melt inside and out. They have less density and show a 13 percent greater loss in storage. The faster cubes melt, the more cubes you need. Buy the long lasting Seaboard ice cubes.

5—Various types of slow melting ice cube makers have been in use for years. Not until recently have ice companies been able to offer the public a genuine ice cube, a cube that gives sales appeal to a drink. A cube, standardized in size to fit the popular size glass, economical in cost and delivered in a sealed, one-trip, watertight bag. This bag is a good insulator, handy to store in your refrigerator or chest.

Page 4 of the circular lists specific advantages of Seaboard's ice cubes.

Looking south on U. S. Highway No. 1 showing icing station, filling station, and restaurant, operated by Folkston Ice & Cold Storage Company, Folkston, Ga.

One-Stop Icing Service for Trucks

FEATURING a one-stop for vegetable trucks, where ice, gas and oil, good food, free showers, and accommodations for rest and sleep are all available, a new re-icing plant is now operating in Folkston, Ga. This service is provided by the Folkston Ice and Cold Storage Company, owned and operated by J. B. Hinson.

This plant is on U. S. Highway No. 1, a few miles north of the Florida line, also on state highways 301 and 23. These are direct routes for vegetables and fruit being trucked from southern growers to northern markets and the return movement. The service was planned to meet all needs of truckers moving along these roads during the vegetable and fruit seasons. Then during the growing season in the north much produce moves in the other direction. Block and crushed ice is available, also blower service. The company also operates a cold storage and freezer plant, opened in 1944, four blocks from the re-icing station. It has a storage capacity of 250,000 pounds and freezing capacity of 30,000 pounds.

Wholesale and Retail Ice

The re-icing station is operated on a wholesale and retail basis, with ice storage capacity of 64 tons, the refrigeration supplied by a Frick compressor. Ice is trucked from an ice manufacturing plant 45 miles away.

The building, of concrete block construction, heavily insulated with cork, was designed by Mr. Hinson. Local labor was used for construction and insulation, and refrigerating machinery was furnished and installed by the Florida Ice Machine Corp., Jacksonville, Fla.

The platform along the 100 ft. front of the plant has a broad extension, 60 feet out at one end. This extensive platform space permits the loading and servicing of several trucks at one time. Drivers appreciate quick loading so no time will be lost in getting perishables to their market in tip top condition. Also local deliveries may be made and ice unloaded from trailer without any traffic jam. While the bunker loader is stationary, the blower is easily rolled to any side of platform for servicing trucks.

Two trucks are operated for ice delivery in Folkston, and a truck-trailer is used for hauling the ice supply. To serve the needs of truckers and their drivers, a parking lot with room for 35 trucks adjoins, also a restaurant and gas station. Another building not shown in the picture, houses showers and lounge rooms where drivers may rest and sleep.

Upper left: Bunker-loading a truck. Incline elevator raises ice to top of truck for rapid bunker icing. Upper right: Preparing to ice a truckload of vegetables. J. B. Hinson and his son John. Lower left: The truck is fully iced, ready to roll gain. Lower right: Another truck icing view.—Pictures by Idell Walker.

Reports from Unit Ice Associations

Florida Ice Association Convention

By Muriel Washburn, Secretary

THE fact that Florida Ice Manufacturers recognize the seriousness of our present day problems was well established when attendance records were broken at the twenty-fifth annual convention of the Florida Ice Association held in the Columbus hotel in Miami, Fla., October 8, 9 and 10, 1950.

Members, their ladies, associate members and guests from all parts of Florida as well as other states, arrived in Miami early and were waiting for the registration desk to open on the afternoon of October 8. Exhibits set up on the same floor as the business session hall were visited frequently and new ice making machinery, tools, supplies and appliances were examined and ordered from associate members.

Living up to a well known reputation, the Miami Ice Association's welcome party given on the first afternoon was one of the high lights of the annual meeting. Many old friendships were renewed and many new ones made at this lavish party.

The Rev. William O. Hanner, Pastor of St. Stephens Episcopal Church in Miami, not only gave the invocation at the opening of the business sessions, but a short talk on the part ice has taken in the advancement of civilization. Every man contributing to the manufacture and distribution of ice Rev. Mr. Hanner stated, should feel proud of the service he renders his fellow man.

Earnest Williams, president of the Miami Ice Association, in greeting fellow ice men and their ladies, assured them their host and hostesses were not only willing but anxious to do everything in their power to make their stay in Miami an enjoyable one and urged them to let them know how they could be of service to them.

A. Sterling Hall, in a response to the greeting, expressed the group's pleasure in being in the properly named "Magic City" and appreciation to all of Miami's ice people for the time and effort they had spent in building this convention into one of the best of all times.

Many past-presidents of the Association were present and introduced at the time the Georgia neighbors and other distinguished guests were recognized.

Officers, Florida Ice Association

President, E. E. Melton, Mulberry
Vice-president, Raymond David, Jacksonville
Treasurer, H. R. Kahler, Miami
Secretary, Miss Muriel Washburn, Jacksonville
Executive Committee: W. C. Airth, Live Oak; L. E. Johnson, Marianna; Edward Hill, Tallahassee; J. R. Gramling, Plant City; F. M. Pumphrey, Daytona Beach; A. Sterling Hall, Bradenton

President's Report

Accomplishments of the Association during his administration were outlined by President F. M. Pumphrey in his report to the membership. Increasing responsibilities in rendering a vital public service with manpower and material shortages were also discussed by the president and in closing he urged all Florida ice men to give the new president, the National and the State Associations their whole-hearted support.

Secretary's Report

The annual report of the secretary, presented in mimeograph form reviewed activities of the past year which included meeting the competition of automatic ice making machines, truck icing facilities for Florida vegetables, new business of icing shrimp, retail vegetable icing, ice advertising, increased use of ice for dressed poultry, merchandising schools. High lights of next year's program will include refresher course in engineering, a top management conference, courses for superintendents to include training in employee supervision and merchandising, and schools for route men that will include merchandising and a driver safety course.

J. F. Causey, sales representative, needed no introduction to his many friends from all over the state, and they listened with keen interest to his discussion of the City Products Corp's. plan for the sale and rental of all ice using appliances.

The original plan developed by City Products was first tried out under his direction in the state of Florida, and proved so successful it was adopted for all of their properties in the United States. The re-adoption of Regulation W has done away with the original plan for domestic appliances but a new program is in the making and the many City Products employees in Florida will do their full share in making it a success.

Work of the National Ice Association

Departments of the National Association of Ice Industries, their directors and the particular services each department renders ice manufacturers all over the United States

New Officers and Members of the Executive Committee for 1950-51 Florida Ice Association. Seated: H. R. Kahler, treasurer, Miami; F. M. Pumphrey, retiring president, Daytona Beach; E. E. Melton, president, Mulberry; Miss Muriel Washburn, executive secretary. Standing: W. C. Airth, Live Oak; Glen Greene, Miami; A. Sterling Hall, Bradenton; J. R. Gramling, Plant City; J. D. Clark, Bartow, Fla.; Roy Hickman, Wauchula; L. E. Johnson, Marianna; J. S. Ostner, Jacksonville; Joe E. Earman, Vero Beach; H. R. Beers, St. Petersburg; Max Kilbourn, Wewahitchka; Edward Hill, Tallahassee.

were discussed by Guy W. Jacobs, Director of the Public Relations Department of the National Association.

Mr. Jacobs listed the many magazines and newspapers in which ice man's ice advertisements and news items appeared during the past year. The innumerable contacts made through these ads giving information relative to the superiority of ice as a preservative of vitamins in fresh fruits and vegetables new ways to glamorize parties, etc., would be supplied upon request. Every ice manufacturer present was urged to take part in this united effort to *show* and *tell* the people of this country about real ICE.

Rushton Talks

The incomparable J. Frank Rushton, past president of the National Association of Ice Industries and an honorary life member of the Florida Ice Association, closed the first day's business session with an address titled "The Twilight's Last Gleaming." It was a dynamic, patriotic speech, awakening the convention audience to the seriousness of the times in which we live.

Not to be outdone by their husbands, wives of Miami Ice Manufacturers entertained visiting convention ladies at a lovely Brunch and Fashion Show in Burdines ultra-modern tea room Monday morning.

As the sun began to creep near the water's edge on October 9 over two hundred ice men their wives, associates and guests, boarded two large sight-seeing boats and sailed down Biscayne Bay to the Quarter Club. The hour and a half ride seemed short indeed, as they watched the sun set on the cool, green water and listened to the strains of soft music.

Most of the second morning's session was devoted to reports of committees and election of officers and members of the executive committee.

The new president in accepting the election pledged his full support to the office to which he had been elected and asked all of his fellow members to help him make 1951 an outstanding year in the organization.

A rare treat was afforded those present when Congressman R. L. Sikes from Florida's Third Congressional District gave a factual and interesting report on the United States foreign policy and the problems with which we are so seriously faced. He brought home the importance of every man and woman doing their part in the supreme effort we must all make to bring liberty and freedom to the world.

The genial gentleman from Crestview, Fla., also paid tribute to Dr. John Gorrie and said undying praise should be given Florida's outstanding citizen and humanitarian.

J. Frank Rushton, Jacksonville, Fla.

An Open Forum with Joe R. Gramling as moderator, proved so successful it was hard to get the ice men present to stop discussing one problem and pass on to another and when time was called many expressed a desire to continue this type of activity in future meetings.

C. P. Austin, Director of the Research and Engineering Department of the National Association discussed research programs that the National had sponsored, or was in the process of sponsoring, in large universities all over the country to find new uses, and markets for ice. Among others he named the program worked out for the use of auxiliary ice for mechanical users, the progress that had been made in icing sweet corn, a sanitary test on beverage containers and a survey to locate best sites for vending stations.

F. M. Pumphrey of Daytona Beach, Fla., past president of The Florida Ice Association hands the gavel to the new president, E. E. Melton of Mulberry, Fla.

The Ice Industry

California Association Of Ice Industries

By Jack L. Dawson, *Exec. Mgr.*

AT THE midyear meeting of the Board of Directors of the California Association of Ice Industries, it was decided to depart from the usual procedure of alternating convention sites between Los Angeles and San Francisco by holding this year's convention again in San Francisco at the same location as the 1949 meeting.

Arrangements have been concluded to hold the 31st annual convention at the Fairmont Hotel, San Francisco, on Monday and Tuesday, December 4 and 5, 1950. The convention committees have been appointed and no stone is being left unturned by the members of these committees to make this year's meeting bigger and better than ever. It is planned that the second day will be devoted entirely to a merchandising forum, with top-level management topics being discussed on the first day of the meeting.

The individual members of the association have been called upon by the Program Committee to assist in the planning of this year's business program. This has been done by sending questionnaires of proposed discussion topics to members for them to state their preference. Following this procedure we are positive that this year's program will be of outstanding interest to the entire membership.

Arrangements have been made for some 5000 square feet of exhibit space to permit suppliers of refrigeration equipment and materials to display their merchandise and present their sales stories to the members of the association. With an anticipated record attendance, and one of the finest exhibit setups obtainable, we are looking forward to the largest supplier exhibit display of the Association's history.

The National Ice Marketing Institute will conduct a field school at Menlo Park, Calif., during the week of November 13-18, 1950. This will be the third course sponsored by the California Association of Ice Industries during 1950 and it is espected that, as in the past, many of the top management personnel will be in attendance. The members of the association feel that the NAII has performed an outstanding service in bringing these excellent training schools to the unit associations. It is our hope that similar training courses will be made available for the future.

The Ice Industry

Illinois Association Of Ice Industries

By Wm. D. Wright, Secretary

THE 49th annual convention of the Illinois Association of Ice Industries will be held at the Abraham Lincoln Hotel, Springfield, Ill., November 27 to 29. This is a change in time from our usual convention dates, but at that time we should be assured of good weather in contrast to snow and below zero temperatures. A program committee has been appointed and has developed an interesting program. The usual get-together meeting will be held Monday evening, November 27, with business sessions, the banquet party and luncheons, Tuesday and Wednesday. The usual exhibits of associate members promises to be interesting as usual.

This convention, according to members of the program committee, will bring together the best thinking of the men of the industry and out of combined thinking and experience of these men, plans may be made and mental processes stimulated, with the result that members will take home with them ideas that they can put to work profitably in their own business.

All those who expect to attend this convention should make room reservations immediately, if they have not already done so.

Missouri Merchandising Forum Meets

FIFTY persons, members and guests, were present for the fall meeting of the Missouri Ice Manufacturers Association Merchandising Forum held at the Missouri Hotel in Jefferson City, Tuesday, Sept. 26.

The following subjects were discussed at length: Regulation W; selling tie-in products; National Association advertising material; local industry good will plans; and economical operation of ice plants.

Two films, "The Hoover Commission Report" and "Getting Your Money's Worth" were shown by Paul Byrne of the Missouri Public Expenditure Survey. The first film told of the recommendations of the Hoover Committee and its results. "Getting Your Money's Worth" told the story of hidden taxes. Both films were very interesting and well received.

Twenty persons have registered for the Basic Field Course of the National Ice Marketing Institute which was held in St. Louis, October 16-21.

Michigan Ice Industries Association

By Edward Jackson, *Secy.*

THE group meeting and managers' conference held in Lansing, September 28, was well attended with much interesting discussion of the many problems facing the industry. Conclusions reached on the timely and important subjects discussed were of benefit to all present.

At a meeting of the directors held in connection with this meeting, it was tentatively decided to hold the 34th annual convention of the association at the Detroit Leland Hotel, Detroit, Michigan, March 1 and 2, 1951. More details will be furnished later.

Ice Company Challenges City Ordinance

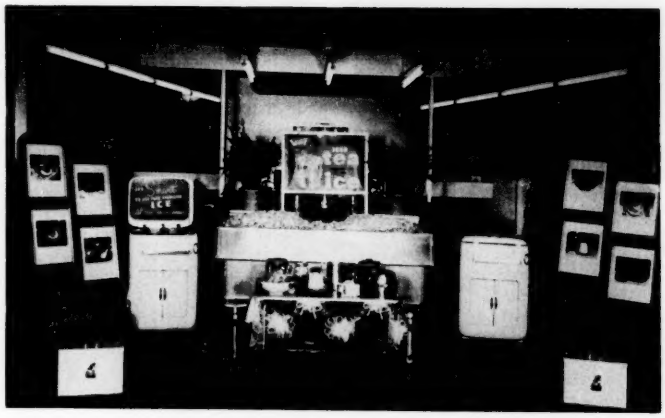
A 1930 city ordinance regulating the distribution and sale of ice within the city limits of St. Petersburg, Fla., faces an early court test to be brought by a north side ice plant. The Lealman Ice Company, 54th Avenue and 39th Street North, recently requested an inspection of its ice scoring machines as a preliminary to initiating court action.

The ordinance prohibits sale of ice within city limits unless it is weighed or scored inside the city. The Lealman Ice Company is located a short distance outside the city limits. According to the ordinance ice must be scored in blocks at least eight percent overweight to allow correct weight upon delivery. City officials said the ordinance was so written to prevent companies outside the city from weighing blocks of ice and delivering them to the consumer considerably under prescribed weight.

"It stands to reason," they said, "that if ice is scored in Tampa and then driven here for delivery the shrinkage from heat would be substantial. The ordinance now on the books was designed to prevent the customers from being short weighted." They said the company could sell ice in St. Petersburg if it set up a scoring plant inside city limits.

Attorney Robert Barton requested a city inspection and approval of the plant and city officials believe this is the first step in a maneuver designed to end in court. Mr. Barton said that although a portion of this ordinance may be valid and for the public protection, it is in general arbitrary and unreasonable and interferes with the conduct of legitimate business.

Ice Exhibit at Los Angeles County Fair



California exhibit shows varied uses of ice at Los Angeles County Fair

THE ice story with all its glamorous and sparkling beauty was brought to the attention of some half-million people who viewed the exhibit of the California Association of Ice Industries at the Los Angeles County Fair September 15 to October 1, 1950. This year's exhibit emphasized the social uses of ice through the eye-appealing demonstrations and pictorials. The great interest shown in the exhibit was evidenced by thousands of favorable comments and questions made by those who saw the displays with reference to the uses of specialty ice. There is no question but that this exhibit gained the ice industry an untold number of customers both in the domestic and commercial fields.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

A. R. Carlson, Chicago, Ill.
Chairman Board of Directors
National Association Practical
Refrigerating Engineers

NEWS
OPERATING
MAINTENANCE
QUESTIONS -- ANSWERS

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435 North Waller Avenue
Chicago Illinois

Come to Los Angeles Convention—Opens Nov. 28

ENJOY yourself while you learn more about refrigeration. That is the keynote of the 41st national convention to open at Los Angeles on November 28. There is a fine engineering program, completed, ready for the attendants. Before, during and after the meeting there will be plenty of enjoyment to make the trip pleasant as well as valuable for the refrigerating engineers.

Everything possible has been done by the hosts in Los Angeles to make this meeting in Southern California memorable in all its phases. Their committees have utilized the abundance of local talent and facilities with expert ability. The educational program embodies an unusual collection of helpful and informative subjects. The engineers will obtain what they want from this program, and field inspection trips will add much of further value.

Convention Program

Tuesday Morning, November 28

Call to Order, Emmett Quinn, National President

Welcome to Los Angeles, Roy Hagen, President, California Consumers Corp., Los Angeles

Response, Walter Bernd Sr., Past President, Washington, D. C.

Annual Reports

New Business

Tuesday Afternoon

Purchasing the Right Evaporator (Dramatized)

Act One, "For a Cooler Room"

Cast:

Plant Owner—Herbert Roydon
Chief Engineer—Ray Burnett
Salesmen—Walter Hilton, David Nurse, Hugh Strange

Act Two, "For a Freezer Room"

Cast:

Plant Owner—Frank Elliot
Chief Engineer—Bill Brittin
Salesmen—Gene Smith, Al Hanson, B. M. Barnitz, Peter Askew, Ralph Moore

High Vacuum Produce Cooling Developments: Harold P. Hayes, Head, Mechanical Engineering Dept., University of Santa Clara, Calif.

Tuesday Evening

Bureau of Refrigeration Information

Chief: M. E. Bell, Sicks Brewery Enterprises, Seattle

Bureaucrats: Leroy Etzel, San Francisco; Howard Peterson, Yakima; Addison Wegener, New Orleans; H. G. Venemann, Purdue University

Wednesday Morning, November 29

Before the Educational Session the delegates and chapter representatives will join at breakfast for a discussion on chapter operations.

Erection and Testing of Refrigeration Equipment: William Orton, Nels H. Rosberg Inc., San Francisco

Modern Fruit Storage Methods and Results: A. Lloyd Ryall, United States Department of Agriculture, Fresno

Wednesday Afternoon

Protection of Life and Property in Refrigerating Plants

a. "Fire Prevention", William Osborn, California Consumers Corp., Los Angeles

b. "Bursting and Breaking of Vessels and Lines," Elmer Johnson, California Consumers Corp., Los Angeles

c. "General Causes of Injuries", Edward T. Allen, Marsh and McLennan, Inc., Los Angeles

Mechanical Refrigerator Car Performance: J. F. Daly, The Atchison, Topeka and Santa Fe Railroad, Los Angeles

Wednesday Evening

Annual Dinner Dance — In the Movie Capital this event promises to be an unusual entertainment feature

Thursday Morning, November 30

Do's and Don'ts of Electrical Maintenance Around Refrigerating Plants: Regis Gubser, California Consumers Corp., Los Angeles

Large Centrifugal Refrigerating Compressors in Industry: H. G. Venemann, Professor of Refrigeration, Purdue University

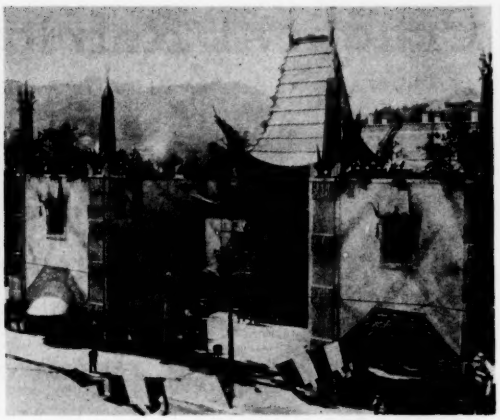
Election and Installation of Officers

Thursday Afternoon

Inspection Trips to Plants

Equipment Manufacturing
Studios: Movie, Radio and T.V.
Food Freezing
Cold Storage
Ice Manufacturing
Breweries
Dairies and Others

Los Angeles County in the Autumn. Golden California oranges and rich leafy greenery with snow capped Mt. San Antonio in the background. A climatic marvel in this verdant plain.



Probably the best known structure in Hollywood is Grauman's Chinese Theatre. Just across the street from the N.A.P.R.E. meeting place, it is a perennial point of interest for all visitors.

Agricultural production, growth of population, shipping, manufacturing volume and other factors including business initiative make Los Angeles a center for refrigeration developments of all kinds. Attendants will gain much from these inspection trips in small groups so that they can see what they wish and have their questions answered.

Thursday Evening

A Night in the West. An informal party for all convention people. Old acquaintances renewed and new friends made while enjoying the final evening of the convention

Friday Morning, December 1

Low Temperature Problems and Headaches (Dramatized)
Cast:
Man with Problems—Ed Nelson
Final Business Meeting
Reports of Convention Committees
Plans for the Coming Year
Other Business
Adjournment of Convention

Special for the Ladies

In addition to the all-convention events the ladies will enjoy a program specially arranged for their entertainment.

TUESDAY AFTERNOON—TEA AND CARD PARTY

Where the ladies will renew old acquaintance and make new friends among the convention group.

TUESDAY EVENING, SPECIAL ENTERTAINMENT

Radio and television shows will be seen in Hollywood where the best in entertainment originates.

WEDNESDAY MORNING, SMALL GROUP TOURS

Shopping Tour, Sightseeing, Movie Tour and more Radio and Television Shows have been arranged so that the visitors can take their choice.

WEDNESDAY EVENING, CONVENTION DINNER DANCE

This is the big event for everyone.

THURSDAY MORNING, SPECIAL SIGHTSEEING TOUR AND LUNCHEON

There is a lot to see and you will enjoy the luncheon too.

THURSDAY EVENING, A NIGHT IN THE WEST

It is the farewell party for everyone with fun and good fellowship.

Headquarters

All the engineering meetings of the convention will be held in the Hollywood-Roosevelt Hotel which is convention headquarters. The group entertainment events are also held there: the annual dinner dance and the convention party the following night. The tea and card party for the ladies is in the Hollywood Roosevelt while the remaining special events are held elsewhere.

Hotel reservation blanks and other information on the convention have been sent direct to the membership. Visitors are welcome to attend these meetings and are invited to write the N.A.P.R.E., 435 N. Waller Ave., Chicago 44, for reservation blanks and a copy of the program.

Ammonia Uniform Control Valve Dimensions

A FORWARD step in the direction of standardization has recently been taken through release of official information that most of the control valve manufacturers are able to supply flanged control valves conforming to the face-to-face dimensions shown in the attached table. This accomplishment is a result of the joint effort of the National Steam Specialty Club and the Instrument Society of America.

REVISED UNIFORM STANDARD FACE TO FACE DIMENSIONS OF FLANGED CONTROL VALVE BODIES SUGGESTED BY THE NATIONAL STEAM SPECIALTIES CLUB

Pipe Size Inches	125 Psi Iron 150 Psi Steel See Note 1	250 Psi Iron 300 Psi Steel See Note 2	600 Psi Steel See Note 3
½	.....	7½	8
¾	.....	7⅝	8⅛
1	7¼	7¾	8¼
1½	8¾	9¼	9⅞
2	10	10½	11¼
2½	10⅞	11½	12¼
3	11¾	12½	13¼
4	13⅞	14½	15½
6	17¾	18⅝	20
8	21⅜	22⅜	24

Note 1—Cast iron bodies with 125 psi ASA B16A-1939 flanges, and steel bodies with 150 psi raised face ASA-B16E-1939 flanges.
Note 2—Cast iron bodies with 250 psi ASA B16B-1944 flanges, and steel bodies with 300 psi raised face B16E-1939 flanges.
Note 3—Steel bodies with 600 psi raised face ASA B16E-1939 flanges.

General Convention Chairman Regis Gubser and his assistants: Don Byl, Frank Eccleston, George Paulick

See You at the Convention—

NO matter how hard they are working on the preparations for the Los Angeles convention, these members of the committee could still smile. Regis Gubser is general chairman of the convention. Also he will present the lecture-demonstration on electrical maintenance which will be one of the features of the engineering program. Don Byl, secretary of the chapter, is Chairman of the Exhibits Committee. Entertainment is under the direction of Chairman Frank Eccleston. Chairman George Paulick of Publicity is telling all refrigerating engineers to be sure to be in Los Angeles for their annual convention on November 28.

A few representative convention speakers. Left to right: H. G. Venemann, Purdue University; Ed. L. Nelson, Union Ice Co.; Ralph Moore, Calif. Consumers Corp.; Wm. Orton, Nels H. Rosberg, Inc.; below: Elmer Johnson, Calif. Consumers Corp.; Wm. Osborn, Calif. Consumers Corp.

Twenty-Five Speakers On Convention Program

PROFESSOR H. G. Venemann, Chairman of the National Educational Committee, regularly presents a valuable engineering subject at annual meetings. He will describe application and operation of large centrifugal compressors in industry. Doubling on the Bureau of Refrigeration Information he will answer questions of the engineers in that popular feature.

Two dramatized presentations will give welcome information of broad interest to engineers. The problems and headaches of low temperature refrigeration will be eased through the methods emphasized by Ed. Nelson. What pipe coils can do in refrigeration of freezer storages will be detailed by Ralph Moore.

The continual extension, modernization and expansion of refrigeration plants emphasize the value of William Orton's paper on erection and testing of refrigeration equipment. Safety and accident presentation will be brought down to definite terms by Elmer Johnson and William Osborn. Fire prevention will be the Osborn subject while Johnson will tell how to avoid bursting and breaks in vessels and lines.

These speakers are a few representatives of the large group of men who will participate in the engineering program at Los Angeles. There are 25 engineers and specialists cooperating to provide complete coverage of the broad range of subjects on the program.

NAPRE Department

Condenser Liquid Sub-Cooling

FURTHER discussion of Question 853 on liquid sub-cooling coil in the sump of an evaporative condenser was given by A. W. B. on page 52, October I. & R. Evidently he is not entirely clear as to the meaning of the term "sub-cooling" nor with the effect of sub-cooling on the condensing pressure. By definition sub-cooling is a process of cooling a refrigerant below the condensing temperature corresponding to a given pressure. For example if ammonia is being condensed at a pressure of 185 psig its condensing temperature will be 96.2 degrees regardless of how low it has been subcooled. The only thing which affects the condensing pressure is the condensing temperature. Liquid ammonia is often sub-cooled 40 or 50 degrees below the condensing temperature but this sub-cooling does not reduce the condensing pressure.

If by the addition of condensing surface of any kind the condensing temperature is lowered, then the condensing pressure will likewise be lowered. Such surface would not, however, be known as sub-cooling surface. Submerged coils are not very efficient as condensers having heat transfer coefficients between 10 and 30 Btu per sq. ft. per degree as against 150 to 300 for shell and tube or double pipe condensers.

Let us look at the situation from another angle. Let us assume a ten ton ammonia refrigerating plant using 3 gpm per ton of 83 F. water, without sub-cooling coils. The weight flow of ammonia will be about 4.3 lbs. per min. and the heat removed from the ammonia will be about 250 Btu per min. per ton or a total of 2500 Btu per min. This will cause the water to rise 10 degrees to a temperature of 93 degrees. The condensing temperature will be higher than this by several degrees depending upon the type of condenser and its heat transfer surface. Let us assume it is 96.2 degrees which will give us a condensing pressure of 185 psig, and likewise a total head pressure of 185 psig if there is no foreign gas in the high side. Here we have a 13.2 degree approach to the initial water temperature or a 3 degree approach to the final water temperature. This would be considered very good practice with a water supply of 3 gpm. and with adequate condensing surface.

A. W. B. suggests that by placing a sub-cooling coil in the sump the approach can be reduced to about 5 degrees, with a resultant head of only 160 psig. which corresponds to a condensing temperature of 88 degrees. But he says nothing of the final water temperature which by all the laws of nature must be lower than that of the condensing ammonia. If there was an infinite or unlimited condenser surface the exit water temperature could approach that of the 88 degree ammonia. This would give a 5 degree rise in the water temperature, which would necessitate almost 6 gpm per ton instead of 3, and even then there would be no sub-cooling. To reduce the head pressure the gas must be condensed faster and at a lower temperature. This cannot be done by any amount of sub-cooling.—H. G. VENEMANN

N A P R E Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Air Distribution

Question No. 863: Will you please show the formula for the throw in feet and the quantity in cubic feet per minute of air from a tapered circular nozzle size 8 inches x 12 inches x 16 inches long with four tenths inch water pressure on the nozzles?—J.W.B.

ANSWER: This question has been answered by R. D. Madison, Research Engineer of the Buffalo Forge Co. The formula for the throw in feet is complex and requires explanations far beyond the understanding of most of our members. If, however, J. W. B. is desirous of studying it he may secure a copy of the Nov. 1946 issue of Heating, Piping and Air Conditioning Magazine, page 108. This issue contains an article on Throw of Air from Slots and Jets by R. D. Madison and W. R. Elliott, giving formula and supplemental chart for the solution of throw problems. Mr. Madison's answer below refers to this chart.

"If I get the picture correctly the nozzle is 12 in. at the large end and 8 in. at the small end, the length being 16 in. If the discharge is from a plenum, the coefficient is about .94 (page 121 Fan Engineering) for this shape. With 0.4 in. static pressure, the velocity would be 2530 fpm. $V=4005\sqrt{p}$ The discharge would be the area times the effective velocity equals $0.349\times2530\times0.94=830$ cfm.

"The term 'throw' relates to the distance the air is projected. Theoretically in an open space it wouldn't stop. Consequently (unless otherwise specified) the term throw has come to mean the distance to a point where the average velocity is an arbitrary value of 50 fpm. The chart is plotted against maximum residual velocity, which in practice has been found to be very nearly 3 times the average velocity. Turning to the chart and finding the intersection of $3\times50=150$ maximum residual velocity with 2530 fpm initial velocity we find the throw is equal to about 74 diameters of jet. The effective diameter is $\sqrt{.94}\times8$ in.$=7.75$ in. Therefore the air will go $74\times7.75/12=47.7$ ft. before a mean velocity of 50 fpm is reached."—R. D. MADISON.

P.S. The formula for air velocity given above may be more readily recognized by our members in this form: $V=60\sqrt{2gh}$, where V represents air velocity in feet per min.; g is the acceleration of gravity (32.2) in feet per sec, sec; and h is the head in feet of air (27.7) equal to the head of (.4 in.) water.—H.G.V.

Heavier Condenser Tubes

Question No. 862: In a Freon-12 condenser which requires retubing, would there be any appreciable difference in performance if the condenser were retubed with 16 gage 1 inch O. D. tubes instead of the present 18 gage 1 inch O.D. tubes? Should the tubes extend beyond the tube sheets before they are expanded or should they be cut to exact length? Is there a formula covering this or is it based on experience?—J.W.B.

ANSWER: The performance of the condenser would be practically the same with the heavier gage tubes as with the present 18 gage tubes. The 16 gage tubes would cause a slight increase in water velocity which would tend to improve the heat transfer coefficient.

The tubes should extend about $\frac{1}{8}$ of an inch beyound the tube head after they are expanded. This means that before they are expanded they might be as much as $\frac{3}{8}$ of an inch longer than the over-all distance from head to head. The tubes will shorten while being expanded. I know of no formula that will cover all designs.—H. G. VENEMANN.

Conditioning Candy Room

Question No. 864: Please advise us how to control humidity in our candy room where we have coil type refrigeration with thermostatic control. We have drip pans under each coil, which pick up moisture and causes our humidity to be too high. The temperature of our room is from sixty to sixty-three degrees. Our relative humidity is running from sixty-eight to seventy-two percent. —R.V.G.

ANSWER: A room having a dry bulb temperature of 60 degrees and a relative humidity of 70 percent contains about 54 grains of water vaper per pound of dry air, and has a dew point temperature of 50 degrees.

Your problem evidently is to reduce the number of grains of moisture in the air without lowering its dry bulb temperature. I do not believe that the drip pans under your coils are the cause of the high relative humidity. On the contrary the pans merely collect the moisture which has been taken out of the air. This water should be drained off, but I do not believe that it will re-evaporate and go back into the air even if it were not drained off.

There are two ways of keeping the relative humidity down without lowering the dry bulb temperature, (1) prevent moisture from entering the room through the doors and (2) precipitate the excess moisture.

The first way involves the use of ante-rooms around the doors. with cold air diffusers to dry out the incoming air. The second result may be accomplished by the use of driers such as silica gel, activated carbon, or activated alumina, or by reducing the dew point temperature of the air. By lowering the dew point temperature of the air to 41 degrees the air would hold only 38.5 grams of moisture per pound and the relative humidity would be lowered to 50 percent without changing the room temperature of 60 degrees.

To do this it would be necessary to operate the coils with a lower suction pressure, and in order to prevent the room from becoming colder, part of the room coils must be cut out of service. It would do no good to cut part of the coils out of service unless the suction pressure were reduced on the remainder of the coils.—H.G.V.

New Questions

Contamination of Lube Oil

Question No. 865: One of our ammonia compressors with new bronze inserted cast iron rings installed last winter had been running 52 days when the oil in the crank case turned very dark. The oil was cleared up with an oil purifying unit without stopping the compressor and the results were very good. The oil remained clear for three weeks and then became very dark and cloudy in appearance as before. What do you think is causing this condition and why does the compressor run so long before the oil is affected?—F.C.

Does Oil Tend to Remain In Evaporators?

Question No. 866: In a refrigerating plant where there is no oil separator on the discharge gas line between the compressor and condenser, oil gets into the system, causing improper operating conditions when ammonia is the refrigerant. Is there any practical and economical way to remove the oil from the liquid refrigerant during normal operations? Will the oil in the evaporators eventually be removed after several hot gas defrosting operations? —S.L.C.

Pump Selection

Question No. 867: When selecting a centrifugal pump for an application requiring a varying capacity, is it best to choose one that has its maximum efficiency at the maximum capacity required?—M.P.

NAPRE Department

News Notes and Activities of Chapters

New Orleans

By LEO J. VIVIEN

AT OUR meeting of August 18, a course in refrigeration was started by Edwin Ford, recent instructor of Refrigeration at the Delgado Trade School. Mr. Ford started his talk with a general discussion of the refrigeration cycle in its elementary form. He informed the members that this course would consist of a minimum of six lectures. At the conclusion of Mr. Ford's discussion, Louis Nettleship, engineer for Frick Company lectured before the chapter on the subject of "Design and Operation of Ice Plants." Mr. Nettleship showed slides and pictures of very old and antiquated plants and some of the very latest type plants. He informed the men that the refrigeration field is progressing so rapidly that it is necessary for constant research and study for the engineer to keep abreast of the developments.

At our meeting of September 8, due to the enthusiasm created at our previous meeting and the interest in the refrigeration course being conducted by Mr. Ford, the membership present had increased to about twice our normal meeting. John O. Wessel, service manager of Frigidaire Sales Corp., conducted a two hour lecture and demonstration on "Refrigeration Fundamentals."

Mr. Wessel's lecture was conducted on the same plan which the Frigidaire Corporation uses in training their engineers, by discussion of the variout subjects, by repetition of these subjects on motion picture films and by practical demonstration of the subjects discussed. He had on display and in operation refrigeration systems where he was able to make a demonstration of the operation of the thermostatic expansion valve. The members were well pleased with this lecture.

An excellent talk on the "Status of Modern Industrial Lubrication" was presented and illustrated by Herman A. Tucker of the Keystone Lubricating Co. It created an unusual amount of interest and meeting attendance was greatly increased. In addition to presenting an analysis of present day lubricants and their application, Mr. Tucker gave a demonstration of a number of laboratory tests on lubricants. A copy of the paper has been forwarded to national headquarters for publication.

Memphis

By CHARLES CONLEY

Through the courtesy and cooperation of H. H. Sims and W. P. DeLong of the Continental Baking Co., more than 60 members and friends of the chapter enjoyed a tour of inspection through their local plant. The visitors were told that this is the fourth largest bakery in the world. It turns out 120 loaves of bread a minute for 24 hours a day and in addition they produce a large volume of cakes.

The visitors saw the large volume equipment in use and had the operations explained to them as they were led through the plant. Included were the large jacket cooled mixers, the divider which measures the dough into loaf size and the rounder and molder which prepare the loaf for the baking pan.

Then they followed operations which convey the loaves through the large controlled temperature oven to the cooling and slicing processes. Refrigeration is used throughout the plant for storing ingredients, control processing and final cooling. For the various refrigeration demands the plant is equipped with 15 refrigerating units ranging from 1 to 15 tons capacity. Two of the dough mixers have direct expansion refrigeration while the other two are cooled with anti freeze fluid.

At the end of the trip the visitors were served refreshments including cakes, milk and coffee. Also each received a loaf of Wonder Bread as a sample to take home.

Chicago

By E. B. Jones

THE fall season of Chicago Chapter was opened with a field trip to the plant of the Central Ice Cream Co. The group was welcomed in the name of the chapter by Vice President Garnaas who then called on Clarence Querman, Midwest Engineering and Equipment Co. to discuss "Compressor Design Trends."

For some 35 to 40 years there has been a tendency to go to vertical machines, Mr. Querman said. In early years these were operated at fairly slow speeds. Then about 1925 forced feed lubrication came into use with drilled crank shafts and connecting rods to supply direct lubrication and later oiling systems were installed to feed oil to the cylinder walls. There was a rather regular increase in compressor speeds from this time which considerably increased capacity ratings.

Mr. Querman discussed valve designs which along with improvements in lubrication had permitted higher speeds with good efficiency and life of the machines. The valves, he pointed out are the principal limiting factor in any speed increase over present ratings. As a sidelight on mechanical efficiency he discussed the considerable reduction in friction obtained through the substitution of shaft seals for shaft packing.

Mr. Querman described the machines to be seen later in the plant inspection. It is current practice, he declared, to protect compressors not only against liquid slugs, but also to guard against excessive superheat. The latter may be just as harmful because it may lead to poor lubrication, uneconomical operation and excessive maintenance. A general discussion on compressors and their operation followed.

The Central Ice Cream Co., has an automatic internal liquid recirculating system installed (page 49, 1949 Operating Data Book). The services this system handles were described by J. E. Watkins, Midwest Engineering and Equipment Co. He told how refrigeration is applied to the various sections of the plant. The ice cream freezers as originally installed require normal temperature liquid in order to produce flash gas, but these are to be changed over so that they can use the low pressure and temperature liquid from the recirculating system.

An interesting use of gas engine drive for the booster compressors was described by Mr. Watkins. At the time of installation very low summer gas rates were offered and the gas engine drive was installed. Considering lower power demand charge and other savings, the reduction in cost he said, was considerable. The same time one third of the heat of the gas consumed was reclaimed by heating of water for plant use.

The plant equipment also includes an induced draft evaporative condenser in which the air circulation is induced in a downward direction by water sprays and the saturated air is relieved through louvres and space between them and the tube bundle.

In a discussion of the plant features and the results obtained with them, chief engineer Gerhard Barbier praised the operation of the induced draft condenser. He was a bit skeptical, however, of the overall value of the gas engine drive in their plant. He said the engine had been operated at too high speed and also did not have proper bearings for the continuous heavy duty service. Early maintenance was high but there was improvement when an outboard bearing was installed and the engine was operated at considerably lower speed.

Following the meeting Mr. Barbier and his associates conducted the group on an inspection tour through the plant. Then everyone enjoyed refreshments made of the plant products.

Six representatives of compressor manufacturers participated in the program in the October 3 meeting. They were R. F. Christiansen, Creamery Package Mfg. Co.; William Walker, Carrier Corp.; Clarence Querman, Midwest Engineering & Equipment Co.; E. J. Kocher, Vilter Manufacturing Co.; Eugene Rytlewski, Westerlin & Ccampbell Co., and C. S. Neibauer, Worthington Pump & Machinery Corp.

The refrigeration course portion of the program was led by Emerson Brandt who announced that it would deal with design, checking and maintenance of V, W, and V-W compressors. He directed numerous questions to different members of the panel to bring out information about these compressors.

Among other things the manufacturers representatives reported that the newer high speed compressors for the most part operated within maximum piston speed limits of 600 to 700 ft. per minute. Despite their compact design these machines were reported to be easier to inspect and maintain because their parts are smaller and not so difficult to handle. Also different capacities are obtained in many models by varying the number of cylinders from four to sixteen. Thus a small investment in repair parts will supply the equipment necessary for rapid maintenance and repair.

These higher speed, multi-cylinder compressors were reported to cost approximately the same as similar capacity in the larger vertical machines. The motor, starter and drive for the multi-cylinder machines were reported to cost less.

In a later section of the program the same industry representatives discussed field application and operation of the newer type compressors under the leadership of President Leslie Clifford. At the request of the leader the different men described recent refrigeration applications which they considered most interesting.

Mr. Christiansen told about a new ice cream plant having a freezing tunnel in which 3,600 one pint packages of ice cream are hardened per hour. The freezing tunnel operates at —45 degree F with an air velocity of 25 miles per hour and the pint packages are hardened in 45 minutes from the time they enter the tunnel.

Mr. Querman discussed comparative efficiencies of vertical and multi-cylinder machines. The results are comparable on some machines but in others the multi-cylinder models require greater horsepower per ton. Other manufacturers point out that the lower efficiency was found in the machines of rather small bore and also that the newer designs are giving increased efficiency in these machines.

Mr. Walker discussed application of centrifugal compressors, one of which operates at —100 F. The attendants at the meeting participated with enthusiasm in the discussion and presented numerous questions which were analyzed by the experts.

San Jose

By Fred Byl

On September 25 we held our first Fall meeting of the San Jose Chapter which was very well attended. The evening was taken up by a discussion led by Professor Harold Hayes on the 1950 Operating Data Books that were sent to us a short time ago. The fellows were full of questions and there was considerable discussion on the various questions and answers that were brought up.

Professor Harold Hayes and our program chairman, Bob Roberts, outlined their proposed educational program for the coming Fall meetings. The chapter is going to secure various A.S.R.E. application data sheets and present to the members throughout the Fall. The thought being that a good many of our operating engineers that are unable to attend regularly would probably get more out of our meetings if we could have short and yet complete discussions on various phases of refrigeration. The members were very enthusiastic about this novel way of approaching our educational phase of our programs.

Our coming meeting on October 9 is a plant visit to the Modern Ice & Cold Storage Company here in San Jose. This company is growing very rapidly, not only in the cooler storage, but also in quick freezing and freezer storage, so our coming meeting should be outstanding.

Pittsburgh

By Otto Knoch

For their September 20 meeting, Pittsburgh Chapter was invited by the company of Jenkins, Morris & Johnson, Inc., to attend the formal opening of their new machine shop. Messrs. Jenkins and Morris are members of the chapter, having started in business just 3 years ago and this is a demonstration of their progress. An opportunity was given to inspect their new equipment and samples of the completed product were on display. They are representatives of the Vilter Manufacturing Co., so all the latest literature on air conditioning units, valves, fittings, ice machines, etc. could be procured.

As part of the entertainment, a picture of the 1950 Olympic Sports was shown. They also had a souvenir key ring for each guest. A social hour followed the picture with group singing. The singing was accompanied by an accordionist. The chapter presented Mr. Jenkins with a large cake which was to extend congratulations

and best wishes for their continued success. Forty members attended this affair. Our next meeting will be on October 18 at which time our election of officers will be held.

Pittsburgh Chapter regrets to report the death on September 22 of Mrs. Edward Tebbets, wife of one of its honorary members in Clearwater, Fla., where they had been residing for the past three years. Mrs. Tebbets had suffered from a broken hip which finally resulted in her death. Andrew Singer of McKees Rocks, a chapter member and Mrs. Singer attended the funeral. Mr. Tebbets was well known in this district, having operated the Coraopolis Ice Co. and the Crafton Ice Co., up until his retirement ten years ago. He was very active in the Ice Association and the NAPRE and both of them attended many conventions. Mrs. Tebbets will be remembered for having been Chairman of the Ladies Entertainment Committee at the time of the national convention in Pittsburgh in 1929. A letter of condolence has been sent to Brother Tebbets expressing the sympathy of the chapter.

Rio Grande Valley

By Armin Doneis

Instructor John Muller displayed before the class some compressor rings and asked the class to examine them and comment on their conditions and probable cause of very rapid wear. They had been installed less than a year ago and were completely worn out. A lot of discussion was brought out as to why these rings wore out in such a short time. Nothing positive or conclusive was decided upon as to the probable cause.

Mr. Muller discussed design and operation of condensers and gave a pretty complete dissertation on noncondensable gas, when and how to purge, and where. The session was considered beneficial and very interesting by all who attended. Our chapter has been using the course material prepared by several practical refrigerating engineers for use at Texas A & M College by the Southwestern Ice Manufacturers' Association, and the chapter members find the course material very useful.

At the second meeting Mr. Muller submitted several sample sections of used condenser tubes for inspection by the members present and he asked their judgment as to their probable future useful life. Several members expressed the belief that the tubes were apparently in good condition to serve satisfactorily for several more years. Mr. Casberg pointed out that the point of probable earliest failure might be near the ends of the tubes where they are rolled into the tube sheets, and suggested there would be the point that would tell most about the future serviceability of the tubes.

The topic of the evening was Refrigeration Procedure in Dam Construction. Armin Doneis who had just returned from several months troubleshooting service at Fort Randall Dam at Pickstown, S. D. told of his experiences there. With the help of over sixty photographs and a projector, he described the procedure of mixing and pouring great quantities of concrete for the walls, tunnels and powerhouse substructure, and gave many general and detailed views of the intake-gate-towers, the draught tube form construction and bracing, and of the ice plant furnishing ice for subcooling the concrete mix issuing from the mixing plant at 55 F.

The pictures illustrated clearly how the slush ice issuing from the Pakice freezers was pumped up 50 feet into the top of the mixing plant. At the conclusion of his talk, Mr. Doneis was complimented on the interesting views and several members expressed regret that more of the members couldn't have been present to benefit from the talk.

The members expressed regret at the news that Earle C. Grass of Edcouch has passed away.

Los Angeles

By Fred Herr

LOS ANGELES NAPRE Chapter varied its educational schedule for the night of October 4 by interpolating a field trip for the usual speakers program in the Terminal Club. Regis Gubser, chairman of the educational session, had arranged for a visit to the Birely plant, a division of the General Foods Corporation, at 1127 North Mansfield Avenue, in Hollywood.

The trip proved an interesting and educational one as the orange juice concentration plant operates on the Mojonnier Process, which uses refrigeration on both the high and low sides. The plant can handle the processing of 500 tons of oranges a day. Members of the Birely Company staff, headed by R. E. Coy, chief of the research staff, served as guides. To give the NAPRE members a chance to observe the operations and have the various processes adequately explained to them, they were escorted through the plant in small groups of 10.

W. R. Burnett, the 200-volt chairman of the local membership drive and vice-chairman of the national campaign, reported that a total of 46 new members had been obtained during the campaign. Of these the Independent team accounted for 36, the California Consumers team for 3 and the Union Ice Company team for 7. With the total early in October still hovering around the 50 mark, the chapter's early-season ambition to round up a total of 500 members by the time the national convention came to town, appears to have gone a-glimmering.

While the number of new members obtained this year is considerably below the number brought in last year, it in no manner or form reflects a letdown on the part of the chapter members. They worked as hard and as enthusiastically this year, under the constant spur of Chairman Burnett, as they did last year, and the more meagre results can only be accounted for by the fact that the field of eligibles most likely has been combed clean.

Rudi Kettler, one of the underwriters of the fishing trips enjoyed by some of the members this past summer, gave Ice and Refrigeration a report of the prowess of the participants. On the August trip, which left Port Orange with 16 fishermen aboard, a total of 18 albacore were caught, with Frank Hooper hauling in the prize winner, a 22 pound albacore. Eleven members went on the September 9 trip. Fourteen albacore were pulled from the briny deep. Biggest one was that of Don Clegg, which weighed 34½ pounds. These trips proved so productive of good fishing and a good time, that further outings of the type will most likely be held next summer.

Fresno

By M. Pedersen

THE twenty-fifth anniversary of Fresno Chapter was celebrated on September 28. The meeting was in the garden of the home of President C. P. Shupe. The festivities began with a dinner which was concluded when a large cake decorated with the emblem of the association was placed on the table. Mr. Shupe cut the birthday cake for the chapter and served the members and guests who were in attendance. Letters and messages congratulating the chapter on its silver anniversary were then read. They came from national officers, other chapters and former members of Fresno.

Among the delegation of three men who came from San Francisco twenty five years ago to present the charter was Elmer Ross who reviewed that trip in his letter of greeting as follows:

"Twenty-five years ago, Brother "Pop" Geisler, the instigator and main founder of California Chapter No. 1, NAPRE and Brother Fulmer with his big open Studebaker, took your humble servant on a "wild ride" from Berkeley to San Jose, through Pacheco Pass — (and what a ride that was!)—and right on through the glorious San Joaquin Valley to Fresno, in time to present the chapter with its charter.

"These two beloved members have passed to their reward, but as I have not as yet earned my reward, I am still hanging around. It is with sincere regret that I find the press of business will not permit me to again be present at this Twenty-fifth Anniversary of your chapter, but my mind is filled with the pleasant memories of that occasion and the many other NAPRE gatherings that saw many of your illustrious members present.

"I know that those hardly souls who started Fresno Chapter and the many men who have since joined hands in keeping up the good work, feel more than compensated for their trials and tribulations, by the knowledge that they have helped many an engineer to a better understanding of his work, and thus have produced a better product faster, for the ultimate consumer.

"In doing this, they and he have raised the professor of engineering to a plane far above their fondest hopes.

"Although I can't be with you in person, I am in spirit, and please accept my hearthy congratulations on this, your twenty-fifth birthday!"

ELMER ROSS

In the next portion of the program there was a prize drawing which was won by our newest member, Thomas Hagar. Then the group enjoyed themselves informally.

Seattle

By CHESTER BERTUS

The fall season of Seattle Chapter was opened with a dinner dance at the Manor, one of Seattle's best night clubs. The affair was well attended and everyone enjoyed an evening of good entertainment and good fellowship.

Regular meetings were resumed at the YMCA with the usual dinner preceding. Following the business meeting Mr. Rittenburg gave a report on the Seattle ordinance and refrigeration code. He said that eight meetings had been held to discuss provisions of the code and that it is in its final stages of preparation. A public hearing will be held before the ordinance is enacted.

The special speaker of the evening was Mr. Frost of the York Equipment Co., who gave an illustrated lecture on V-W compressors and centrifugal equipment.

It was a pleasure to have national vice president, Howard Peterson attend this meeting. He responded to the greetings from President Pamment and told about the 41st annual convention which he urged as many members as possible to attend. The secretary distributed the 1950 Operating Data Books to the members.

Claude Corn Deceased

WHILE on a fishing trip in September, Claude H. Corn former president of Minnesota Chapter died suddenly. A representative of the Metropolitan Refining Co., Mr. Corn had earlier served the chapter as Chairman of the Educational Committee and was its president in 1948 and 1949. He was always an active and interested worker in the group. Born 59 years ago in Asheville, N.C., Mr. Corn had been a resident of Minneapolis for a number of years.

Across the Line In Membership Race

AS THE November issue went to press the 1950 membership race was just concluding and the totals of the contestants were being compiled to see who earned the chapter trophies and the individual prizes: A complete report will be given in the December issue.

Draft Prospects Indicate Tightened Labor Market

INDUSTRY generally is in for a tighter labor market as defense production and military demands are stepped up. This fact is seen as inevitable since the armed forces will be increased from about 1.5 million men in service now to about 3 million within a few months. In addition demands for workers in war industry are increasing rapidly.

To meet the demands for military personnel, the age group 19 to 26, now subject to the draft, will be worked over intensively. Deferments on the grounds of occupation will be increasingly difficult to secure and few and far between. Deferments because of dependency may be eliminated soon. Chances are that Selective Service Regulations will be amended so that fathers may be drafted.

Under the current Selective Service Act, veterans of World War II cannot be drafted. The veterans' exemption provision is written into the law itself. To change it requires Congressional action. Informed observers believe this may be forthcoming early next year.

In the light of the above, a bulletin has been issued by the National Association of Ice Industries advising ice companies that they should:

1—Expect to lose almost all of their physically fit young men under age 26.

2—Plan their replacement now with older workers.

3—Inquire carefully into the draft, reserve, and National Guard status of every prospective new employee.

4—Decide now the particular employees under age 26 for whom deferments will be sought.

This is a realistic view of the draft situation as it looks now. If the international situation becomes increasingly serious, it may be necessary for Congress to increase the draft age. There are reports that a bill to increase the draft age up to age 35 will be introduced next January.

To forestall possible future critical shortages of labor, the National Association has already—

1—Presented to each of fourteen key government officials a memorandum showing the vital importance of the ice industry during a national emergency and highlighting the industry record in World War II;

2—Made strong representations to a special committee of the government to the effect that the critical occupations shown on the current Labor Department list do not include many occupations in the production and distribution of ice absolutely essential to continuity of operations, and suggested additional occupations for inclusion on the list;

3—Started to lay the ground work for the possible future employment of immigrant workers by member companies, especially those located in border areas, should the need arise as a result of an "all-out" war effort.

4—Established contacts with representatives of Selective Service, the Labor Department, including the U. S. Employment Service, and other agencies concerned with manpower.

European Engineers Compare Refrigeration

A GROUP of European refrigerating engineers and food technologists reached Chicago recently on a nationwide tour sponsored by the U. S. Office of Economic Cooperation. They were on the last portion of their journey and had inspected many food processing and handling facilities in all sections of the country.

At the invitation of the group leaders, Emerson Brandt and Eugene Rytlewski represented the N.A.P.R.E. in a meeting to discuss plant operating practice with a number of the visiting engineers. Some of the subjects which came up incidentally in the discussion were of particular interest to engineers over here.

Surprise was expressed by some of the visitors at the age of much of the refrigeration production equipment in use in U. S. plants. It was stated that power costs are much higher in Europe and it is customary to emphasize power savings more than reduction in plant construction or equipment costs.

The visitors wished to have reasons for the numerous varieties of insulation used in low temperature structures and the variation in the thicknesses used for similar conditions. They gave the impression that heavier insulation is usually applied in Europe and more thorough application of moisture barriers is the rule.

One manufacturer of refrigeration machinery found it difficult to reconcile the U. S. wage rates with the selling price of the refrigeration machinery here. He said that in Europe his plant uses machine tools made here or of similar design. With wage rates of one third, the equipment sells at a price somewhat above U. S. levels. It was revealed in further analysis that the plant overhead figured on his production was considerably higher and apparently accounted for most of the difference in selling prices. Partially this could be attributed to mass production here, but a difference in pricing philosophy was apparent.

Division of American Warehousemen's Association

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THIS MONTH IN BRIEF

Frozen split pea soup has been developed as a profitable freezer-storage product by a California warehouseman.

A new freezing process for freezing eggs in the shell has been developed by Louisiana State University, Baton Rouge. This process offers much of interest to refrigerated warehousemen and others since it provides a method of holding shell eggs for a year or more in perfectly fresh condition.

Valuable seed corn can be held in cold storage which will retain its keeping qualities over a period of several years.

Occupancy of refrigerated warehouses on September 30 was 63 percent for coolers and 74 percent for freezers. Cooler occupancy was down one point and freezer occupancy was unchanged from the previous month.

Losses estimated at close to twenty million dollars annually from deterioration of eggs handled by country buying stations. The loss is due to lack of adequate refrigerating facilities.

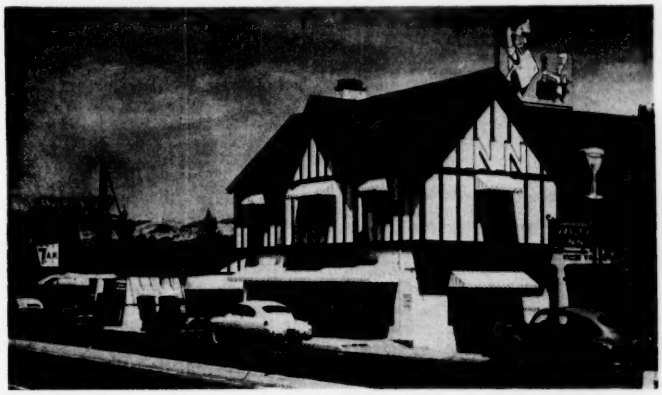
FROZEN SPLIT PEA SOUP

How a profitable freezer storage product was developed by California Warehouseman

ROBERT REISTRUP

A THRIVING, profitable refrigerating business has been established at Santa Barbara, Calif., by Wm. Mosley, Jr., president of the Polar Ice & Cold Storage Co. Back of that prosaic statement lies an unusual story. When Mr. Mosley acquired the facilities of this plant some three years ago, it was defunct. He then began to cast about for ways and means to utilize the physical property of the plant to the best advantage and naturally at a profit. He operated on the theory that modern merchandising of refrigerated products requires modern handling and Santa Barbara territory, with an eye towards lining up those who would return him the greatest profit on a long term basis. These included those who needed convenient location, assurance of properly supervised and regulated refrigeration at established temperatures, space to fit individual requirements, fair rentals and other factors important to distributors of perishable products.

The result was a healthy handful of customers storing frozen berries (for pies), eggs, yeast, beer, orange juice, bulbs for florists, fresh produce, potatoes, ice cream, extracts and all



Front view of Andersen's roadside restaurant, original home of split pea soup at Buellton, Calif. Green split pea soup, served as a specialty, is processed in frozen form by Polar Ice & Cold Storage Co.

that a need existed for such a service in that area. The result is a plant manufacturing ice, processing of the only frozen pea soup on the market today, and the frozen storage or refrigeration of everything ranging from beer to bulbs.

Survey of Customers

Mr. Moseley approached the problem of selling space by first making a survey of potential customers in the types of frozen foods. Important regional and national brand names were among the first to become his clients. Storage space was tailored to fit requirements.

Ice Plant Installed

Polar utilized one-tenth of the space available with a thirty ton ice plant installation which not only furnishes ice for large scale produce and fish (indigenous to the area) refriger-

Seven year old Robby Mohan Andersen, not yet old enough to be of much help around the place, is being served a plate of pea soup by his father, Robert T., son of the founder and now manager of Andersen's. The modern roadside restaurant was started 26 years ago serving split pea soup.

ating, but also for its own home and commercial routes supplying all forms of cube, block and crushed ice.

Refrigeration Adapted to Frozen Split-Pea Soup

With this sales campaign momentum well under way, Andersen's of Buellton, Calif. were sold on the idea that these facilities offered excellent advantages for the processing of their product, green split pea soup, in frozen form. The president and general manager of Andersen's, Robert T. Andersen (famous for more than a quarter-century in the field of fine foods) had previously developed and perfected a successful process in quick freezing that retained all the flavor, color, texture and quality of the original recipe split pea soup, a specialty for which the Buellton establishment is renowned.

Storage Service Planned

Andersen's was ready for expansion. Accordingly, Polar tailored an original four thousand square feet of space for their use. This is a self-contained plant within the walls of Polar's plant but distinctly removed from all other operations. Andersen's also leases storage space from Polar for reserve stocks of their frozen soup, where it is finally moved into refrigerated trucks for ultimate distribution to the frozen food boxes of retail stores. The present annual rate of sale of this famous product is more than one million pounds. At the Buellton restaurant, more than 250,000 customers are served each year.

In the three years since Moseley took over, he has transformed a white elephant into a thriving industry now serving importantly as a distribution and storage point for many allied products in the food and beverage field, in Santa Barbara. Most interesting, and typical of Moseley's ingenuity in selling space, was his placement of Andersen's plant at Polar, since it provided natural and certainly convenient facilities for the processing of a product dependent upon refrigeration both in freezing and storage. The combination has worked out very satisfactorily for both Polar and Andersen's and additional space has been optioned by the latter for their planned expansion, designed to meet the ever-increasing demand for Andersen's split pea soup, frozen form.

Poultry Institute Moves

THE Institute of American Poultry Industries has moved its offices into larger quarters at 221 North La Salle Street, Chicago.

"With our expanded activities and a growing staff to handle them," commented Cliff D. Carpenter, Institute president, "we needed more room. And we were unusually fortunate in finding these new offices practically made to order for our needs."

Institute Directors, inspecting the new quarters at their meeting September 29, agreed that it would be hard to find a layout better suited to the Institute's requirements. Previous to the move, headquarters had been maintained in the Mercantile Exchange Building at 110 N. Franklin Street, Chicago, for more than twenty years.

Canadian Holdings of Fruits and Vegetables

THE Dominion Bureau of Statistics, Ottawa, Canada, reports that the total stocks of frozen fruit for September 1, 1950 amounted to 19,932,000 lbs. as compared with 18,551,000 lbs. September 1, 1949 and 19,059,000 lbs. August 1, 1950. Frozen vegetables amounted to 10,173,000 lbs. September 1, 1950 as compared with 6,358,000 lbs. September 1, 1949 and 9,421,000 August 1, 1950.

Warehousemen Announce 60th Annual Meeting

OFFICIAL announcement of the 60th annual meeting of the American Warehousemen's Association has been made by A.W.A. General President, Horace W. Wilson. The meeting will be held at the Statler Hotel, Boston, Mass., February 5-8, 1951.

With the Defense Production Act of 1950 on the books, and with a lot of the old wartime bugaboos haunting the warehousemen's doorsteps again, the theme of this convention will be "Profitable Warehousing in an Emergency Economy," the importance of which is obvious—it is vital to every warehouseman in America.

The entertainment features, it is promised, will be well taken care of. The New England Warehousemen, Chairman Chris Grimley and his committee, have been working overtime to guarantee their fellow warehousemen a convention they won't forget.

To help promote this convention, red and black letter stickers giving the place and date are being attached to all letters from the A.W.A., the N.A.R.W, and the Merchandise Division. A bulletin from N.A.R.W states that this convention promises to be of special importance because it is not only a significant anniversary in the history of the association but it will also provide a much-needed opportunity for discussion of the problems of warehouse operation at this particular time.

Foreign Trade Zones Install Cold Storage Facilities

REFRIGERATION units are being installed at San Francisco's Foreign Trade Zone to offer limited cold storage to the cargoes moving through the free port. Two rooms, with a total storage capacity of 2600 cubic feet are now available.

The facilities for cold storage are the first at any of the five seaboard foreign trade zones in the United States, according to James Campbell, zone superintendent. The sixth zone, at San Antonio airport, opened September 1 with limited refrigeration facilities.

First use of the new cold storage is expected to be for storage of hams, cheese, and other perishables imported from Europe. The lower freezing temperatures also available will be used for frozen clams, frog legs and similar delicacies. Such ship stores as butter may be brought to the zone by European steamship lines, kept refrigerated and supplied to vessels as needed.

FREEZING EGGS IN THE SHELL

This new freezing process offers a practical method of preserving eggs in fresh condition for a year or more and in a form suitable for all types of use

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IN THE process of freezing eggs in the shell* described elsewhere[1] a slight dehydration treatment was recommended as a prerequisite to freezing in order to prevent cracking of the shell. The amount of treatment measured by the loss of weight of the egg is determined by the freezing temperature, under the limits of the usual range of freezing temperatures.

If frozen or stored after freezing at temperatures below 22 F upon thawing the yolk exhibits a more or less pasty condition which is called hardening; therefore, a freezing temperature of about 25 F. (or above 22 F in general) was recommended as the right freezing temperature for the freezing of eggs in the shell.

At such a temperature with partially dehydrated eggs (to a loss of about 3 percent of their weight) a reversion of the rate of freezing between yolk and white occurs which together with other minor changes, creates the conditions necessary for preventing cracking of the shell during the freezing process. In the present paper only a discussion of the technical aspects of the dehydration treatment and its approximate cost on a semi-plant operation basis will be given.

Water Evaporates

Water from the egg begins to evaporate through the porous shell in to the surrounding air if the relative humidity (RH) of the air at 0 C. is below 99.6 percent. By lowering the R.H. of the air, the rate of evaporation increases. At the same R.H. of the air the rate of evaporation increases with increase of temperature.

The following example illustrates this point.

At 85% R.H. and 0 C. the evaporation per week is 0.12%.

At 80% R.H. and 0 C. the evaporation per week is 0.21%.

At 67% R.H. and 20 C. the evaporation per week is 0.90%.

Another important factor in this process of evaporation of water from the egg is the density or porosity of the shell. White eggs loose their moisture much more easily than brown eggs as will be shown later with definite examples. This process of evaporation under natural conditions is rather slow and it would take at least 15 weeks at 0 C. and 80 percent R.H. to effect the dehydration treatment necessary for the freezing of eggs without any losses from cracking of the shell. Because of the low limits of temperature which can be used for such treatment, without affecting the quality of the eggs one is necessarily confined to processes which would remove water from the eggs through the operation of the other remaining factor i.e of the change of R.H. of the surrounding air.

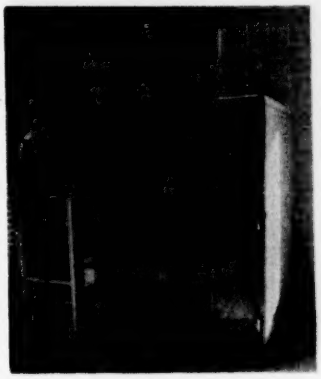


Fig. 1—Small dehumidification unit with drying cabinet.

Two Evaporation Processes

There are two general processes which could be used for such a purpose. The first, a static one operates through the use of dessicant substances and could be used by any one, even by housewives, for freezing eggs in their home freezer, provided that they have a compartment available at the recommended freezing temperature (above 22 F.).

The second a dynamic and continous process has recourse to the use of special apparatus called, dehumidifiers. Such an apparatus is used at present to lower the moisture content of the air in rooms where metallic containers, pipes, tools etc. are stored and where the R.H. must be kept low to prevent rusting.

Two such units of a small size were first used for our pilot plant experiments. The dehumidifier, Dry-Namic type model QD, was designed to dry the air of a room of 15,000 cu. ft. for the purpose mentioned above. Its maximum load per day at 77 F. dew point is according to the specification of the company 24 lbs. of water. It discharges 30 cu. ft. of dry air per minute and has a power consumption of 1225 watts continuous.

When this machine was used to dry the air of a refrigerated room of 600 cu. ft. the results were not quite satisfactory for our purpose. At 50 F. temperature of the room the R.H. of the air was 45 percent or more, but at higher temperatures the R.H. became lower and at 70 F. it was 21 percent.

At this temperature a case of white eggs was placed immediately at the outlet of the dry air coming out of the apparatus which was installed inside the room. The case was provided with holes and also the trays bearing the eggs inside the case were perforated. In 24 hours the loss of moisture averaged about 0.25 percent and with great variation among the eggs of the trays according to their position inside the box, the variation was from 0.77 percent to approximately 0.0 percent. When only a dozen of white eggs was placed in the room at the outlet of the dry air the loss was about 2 percent but with brown eggs the loss was only 0.5 percent.

The second unit (fig. 1) was a Desomatic model SOR-8 which has a maximum load at 86 F dew point of 8 lbs. daily and power consumption of about 250 watts continuous. This unit has been used in connection with a metallic air tight cabinet of 27.3 x 31.0 x 51.5 inches dimensions of a volume 0.693 centimeters (about 25 cu. ft.)

Both cabinet and the unit were placed at room temperature but during the operation the temperature inside the cabinet was 80 F. The mois-

* The process has been covered by a patent assigned to L. S. U.

[1] See Ice and Refrigeration, August, 1949, page 19.

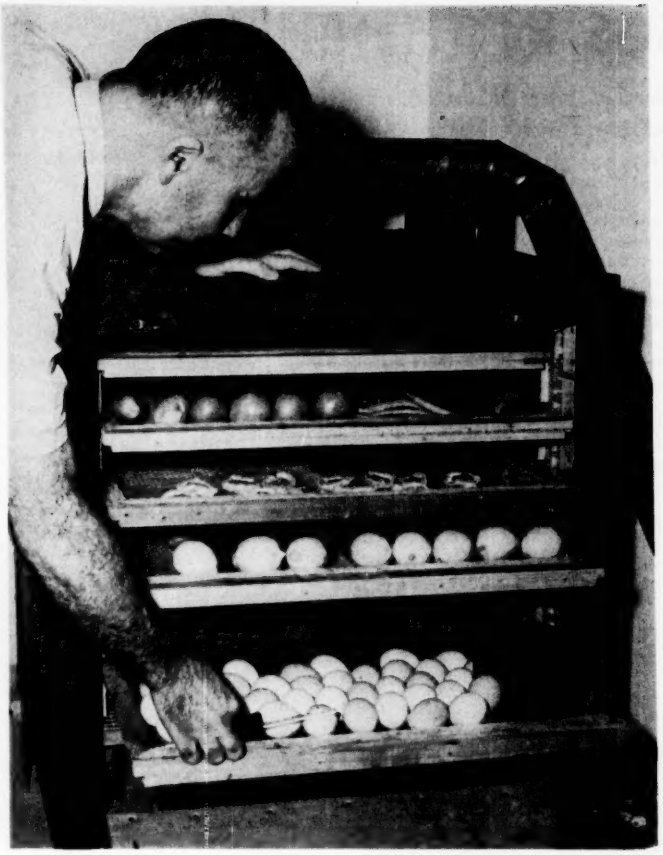


Fig. 2—Drying cabinet connected with dehumidifier.

ture of the air in the cabinet during the operation fell to about 23 percent but with eggs in the cabinet the moisture content increased, to about 30 per cent R.H. When a case of eggs was placed in the cabinet no significant loss of moisture from the eggs was obtained but when the same number of eggs were placed on trays inside the cabinet the average loss in 24 hours was 0.89 percent.

A certain variation in the loss of moisture from the eggs was found according to the position of each tray and the place of the eggs on the tray. The loss of moisture from eggs of the first tray (nearest the dry air inlet) was 1.32, 1.29 and 1.08 percent, the first value being for eggs in the center of the tray and the last two for those in the corners. In the second tray the loss was 1.69, 1.37, and 1.12 percent; in the third tray 1.24, 1.11, and 1.01 percent; and in the last (upper) tray 1.64, 1.04, and 0.60 percent respectively.

When the eggs were placed in egg cartons the loss varied from 0.65 to 0.27 percent according to the position of the carton in the cabinet and on the tray; the first figure corresponding to the center of the first tray and the second to the corner of the top tray.

Trays for Eggs

All these preliminary experiments showed that it would be impractical to try to partially dehydrate eggs in the case and that some sort of trays for placing the eggs during the treatment should be used. A special cabinet of 28.7 x 32.3 x 29.9 inches was constructed so that seven trays 24.0 x 27.3 inches could be inserted (Fig. 2). The total capacity of the cabinet when the eggs were placed on the trays was about three cases. Using a larger unit of Desomatic Dryer Model DOR-38 and the cabinet filled with eggs the results of the treatment after 24 hours were as follows:

VARIATION OF THE LOSS IN WEIGHT OF WHITE EGGS AFTER 24 AND 48 HOURS TREATMENT

Loss in grms.	At the end of 24 hours % of eggs	At the end of 48 hours % of eggs
0.5	14.54	.....
1.0	39.90	11.83
1.5	18.18	13.97
2.0	28.18	39.78
2.5	.....	10.75
3.0	.....	13.97
3.5	.....	6.45
4.0	.....	3.22

These variations could be decreased if the inlet and outlet of air are adjusted so that the air flow is uniform inside the cabinet. The average loss per egg in 24 hours was 1.30 grams or 2.83 percent; in 48 hours the loss was 2.16 grams or 3.66 percent. With brown eggs the respective values were 1.15 grams and 1.86 percent at the end of 24 hours and 1.87 grams and 3.21 percent at the end of 48 hours.

Using Dehumidifying Unit

The dehumidifying unit was placed in a room external to the refrigerated room while the drying cabinet was placed inside the refrigerated room which was kept at 45 F. Because of the heating during the regeneration process the dry air going into the cabinet had a temperature of 90 F. and a relative humidity of 5 percent. During the operation a slight rise in R.H. from 2 to 3 percent was observed.

The specification of this unit was as follows: electrical load 1000 watts continuous, moisture removal at 86 F. dew point 38 lbs/day at 41 F. dew point. 24 lbs./day. Dry air volume 75-80 cu. ft. per min. On the basis of the above specifications and the results obtained as to the change in R.H. of the air during the operation we can conclude that the machine did not operate at its maximum efficiency with such a small cabinet and that with a larger cabinet a larger number of eggs could be treated effectively in a 48 hour treatment.

As long as the R.H. of the air inside the cabinet does not exceed 30 percent the drying operation is sufficiently rapid. It can be safely assumed, therefore, that a cabinet of a total capacity of 24 cases of eggs placed on trays can be operated by this machine and the treatment would not require longer than 48 hours. On this basis the cost of treatment per dozen of eggs would not amount to more than ½ cent especially if the apparatus is provided with humidistat control. On the basis of the specifications given by

the company the cost of the treatment will be two to three times smaller than the above value of ½ cent per dozen.

There are still further possibilities of reducing the cost of the partial dehydration treatment of eggs by using larger dehydrating units, such as the Refrigerant type Dehymidifier or the Lectrodryer unit whose capacity of water absorption reaches 200 lbs. daily, but there is no data available from the use of such a unit in the dehydration of eggs at present.

Another simpler static method of moisture absorption from a product without the use of a dehumidifier consists in placing the product in a closed air tight container with the required amount of a dehydrating agent. Since the time for the treatment is limited in the case of eggs because of its effect on the quality, it is obvious the treatment cannot continue until equilibrium is reached. In general when the moisture in the container is above 30 percent the evaporation of water from the egg is slow.

Dessicant Substances

There are several dessicant substances which can be used. Phosphorus pentoxide and calcium chloride are among the best because they have high absorbing power but they are expensive and the first has the additional disadvantage that it cannot be regenerated. Calcium chloride not only can be regenerated but also has the additional quality of absorbing more water at low temperatures than at room temperature. Below 24 C. it absorbs 1.3 times its weight of water.

Of the low cost industrial products which can be regenerated by heat the most common are Dessicite, activited alumina, Drierite and Silica gel. Their theoretical absorption power runs for some of them to 35 percent, but their efficiency under practical conditions is smaller (about 15 percent). Dessicite No. 30 and activated alumina tested in our laboratory showed about the same efficiency in lowering the R.H. of the air in closed containers under the practical conditions of the egg treatment.

When the container was small and the dessicant was used in the proportion of 1/5 of the weight of the egg the R.H. inside the box decreased rapidly to 5 per cent but when the container was large about 20 percent R.H. was about the lower limit under practical conditions. At room temperature at least four days would be needed to complete the treatment which would be objectional in the case of eggs. Since however not much difference was observed in the absorbing power between room temperature and lower temperatures, the container with the eggs and the dessicant can be placed in a cool place and so the rather long treatment would not affect the quality of the eggs. The reactivating of Dessicite is done at 350 to 400 F. and of the alumina at 400 to 600 F.

Market Value of Frozen Shell Eggs

At present about 55 billion eggs are produced in the United States. Of these, 2000 tons or about 35 million eggs are frozen each year as liquid eggs. These liquid eggs have to be additioned with 20 percent syrup containing sugars, glycerine, salt etc. which makes the product suitable only for bakery purposes. The frozen eggs are packed in containers of 30 lbs. and are not practical for home use or even for small bakeries.

In the preparation of liquid frozen eggs much handling is involved. With the new process of freezing eggs in the shell real progress has been made in the preservation of eggs. With a small additional expense for a slight dehydration treatment the eggs can be preserved at temperatures above 22 F. for a year or more in a very fresh condition and are suitable for all types of use in the same manner as fresh eggs.

Frozen Fruits and Vegetables in Storage

AS FROZEN raspberries continued to move into storage during August, the percentage of stocks stored in consumer-sized packages increased 5 points since July 31 indicating that retail packages moved into storage in greater quantities than institutional-sized containers. Twenty-three percent of the raspberries classified by warehousemen as to container size were in packages of one pound or less on August 31, a record high in the proportion of raspberries in this type package.

COLD STORAGE STOCKS OF FROZEN FRUITS AND VEGETABLES IN PACKAGES OF ONE POUND OR LESS IN STORAGE AUGUST 31 AND JULY 31, 1950 (000 LBS.)

	August 31, 1950 Lbs.	Pct.	July 31, 1950 Lbs.	Pct.
Peaches	2,753	36	1,607	41
Raspberries	6,199	23	4,958	18
Strawberries	36,059	38	33,566	38
Asparagus	5,438	69	5,533	68
Beans, lima	10,449	49	6,616	39
Beans, snap	23,643	69	7,718	57
Corn, sweet	6,460	48	4,601	53
Peas, green	55,117	56	43,263	50
Spinach	11,861	78	14,107	78

Conversely, peaches showed a decrease in the ratio of retail to institutional-sized containers with 36 percent of the stocks of classified peaches in consumer-sized packages on August 31 in comparison with 41 percent reported July 31.

Stocks of strawberries in packages of one pound or less remained proportionately the same as last month. Three-fourths of the total stocks of both peaches and raspberries were classified according to container size while coverage of strawberry stocks amounted to 78 percent of the August 31 holdings.

Packaging data for the six frozen vegetables in storage August 31 covered 63 percent of the stocks on hand. This compares with a coverage of 68 percent last month and 59 percent a year ago this time.

Classified stocks of asparagus and spinach showed little change since July 31 in the ratio of consumer to institutional-sized packages with 69 and 78 percent of relative stocks reported to be in the smaller-sized packages.

A greater net into storage movement of sweet corn in institutional-sized containers raised stocks in this type package to 52 percent of total classified corn holdings.

The remaining vegetable items showed an increase, percentage-wise, in retail containers with 69 percent of the snap beans, 49 percent of lima beans, and 56 percent of peas in the smaller-sized containers. On July 31 the percentages were 57, 39, and 50.

Mechanical Handling to be Discussed at Convention

J. LEO COOKE, president of the J. Leo Cooke Warehouse Corporation of Jersey City will be one of the principal speakers at the fifth annual Industrial Packaging and Materials Handling Exposition to be held at Convention Hall in Philadelphia, Pa., October 10, 1950. He will speak on "What's New in the Field of Mechanical Handling Techniques and Associated Equipment."

Mr. Cooke is a national authority on warehousing and physical distribution matters and is serving as general vice-president of the American Warehousemen's Association.

Huge Egg Losses Can Be Saved by Refrigeration

LOSSES estimated at close to 20 million dollars annually are resulting from deterioration of eggs handled by country buying stations in the North Central States, it has been revealed by a study made by the U. S. Department of Agriculture and State experiment stations in that area.

The loss, due to lack of adequate cooler storage in the country egg buying stations, points out a large potential market for small refrigerating units, relatively inexpensive in price, and designed to meet handler's needs.

The Department's study, undertaken with funds made available under the Research and Marketing Act of 1946, supplemented with funds from other sources, brought to light that only 10 percent of the country stations visited in the 12 North Central States reported having refrigerated coolers. In the central area, Illinois, Iowa, Minnesota, Missouri and Wisconsin, the figure was as low as 7 percent. In the western area, Kansas, Nebraska, North Dakota, and South Dakota, it was 11 percent. In the eastern area, Michigan, Ohio and Indiana, it was 10 percent.

The longer the eggs were held at the country buying station the greater was the extent of the quality decline. When the eggs were held only one day at the buying station during the spring the average decline in interior quality was 8 points, or that is, 8 eggs in every 100 tested dropped one grade. When held two days it was 11 points and more than two days, 14 points. During the summer months the decline was 8, 13 and 18 points. In the fall it was 4, 7, and 8 points respectively. These figures show how rapid deterioration might take place when eggs are not held under properly cooled conditions.

Using the figures on the number of cases of eggs handled, and assuming that eggs are picked up twice a week by the central assembler, the average capacity of a country buying station cooling room should be at least 24 cases of eggs. For the individual stations the size of the room would vary according to the quantity of eggs held by them until picked up by the assembler. Because of the seasonal variation in the quantity of eggs handled and the comparatively low margin at which eggs are handled at the country point, the price of the cooling facilities must be such as to justify any investment made in refrigerating equipment.

The manufacturers of refrigerating equipment could render a service to the country buying stations by having their engineers design plans for an efficient cooling room of different capacities which could be constructed by local contractors at a moderate price. The manufacturers could then supply the refrigerating equipment necessary to maintain the proper temperature and humidity necessary for proper egg storage.

Fact Finding Conference To Discuss Merchandising

HOW and why modern merchandising methods pay off for the poultry and egg industry will command top billing at the Institute of American Poultry Industries' 1951 Fact Finding Conference, scheduled for Kansas City, Mo., next February 11, 12 and 13.

A new half-day merchandising clinic, with displays and demonstrations taken from tried and tested sales programs, will bring poultry and egg processors new ideas they can use to pack more salability into their products; to help retailers ring up more poultry and egg sales on their cash registers; to make poultry and eggs Mrs. Housewife's most popular everyday items; and to capture "small town markets" where consumers haven't always found top quality, conveniently packaged poultry products readily available on a year 'round basis.

Tying in with this modern merchandising theme, the regular processing clinic will feature "packaging to sell" techniques designed to meet Mrs. America's demand for uniformity, convenience, economy and variety.

Also up front on the conference program will be the production clinic, with a short course on sound broiler feeding, housing and management practices and a true-to-life picture of how community teamwork helps start commercial broiler and commercial egg developments off right.

"What may well turn out to be the biggest event of all," commented Cliff Carpenter, Institute president, "is still under wraps at this stage. All we can say now is that we're planning something new and different in contests that will really ring the bell when it comes to tempting the public's appetite with tender, juicy, flavorsome poultry."

With interest in the equipment and supply displays growing keener each year, the 1951 conference exhibit space was stepped up to 28,000 square feet, an increase of 20 percent over 1950. All this space has been sold, however, and additional space is being opened up on the mezzanine, next to the poultry products marketing mart. Floor plans showing available booth locations can be obtained from H. Lee Campbell, exhibit manager, Institute of American Poultry Industries, 221 N. La Salle Street, Chicago.

Cold Storage Preserves Valuable Seed Corn

VALUABLE seed corn, like luxurious furs, demands protection by cold storage if its keeping qualities are to be maintained. Seed corn grown in 1939 and stored under constant cold temperatures germinated almost as well ten years later as did corn grown the year before the test conducted at Purdue University. Other seed from the 1939 corn kept in ordinary storage has long since ceased to germinate. This test showed that costly inbred lines of seed corn can be kept even through crop failures, floods and other crop disasters.

Storing the corn at zero degrees F is slightly more effective in retaining its viability than is storage at 28 F, but any constant temperature between 0 and 40 F is satisfactory.

Dr. A. M. Brunson, Purdue botanist and plant pathologist, conducted the experiment. Based on his findings, he makes two other recommendations for successful cold storage of seed corn. It should be dry, carrying 11 percent moisture or less, before it is stored. Then it should be kept in sealed metal containers to prevent absorption of moisture during storage.

Quick Sheet Provides News On Defense Plans

THROUGH publication of a new form of special news release called "Quick Sheet", the National Association of Refrigerated Warehouses has acted promptly to fill a critical need on the part of its members for information concerning plans and policies growing out of the Defense Production Act of 1950.

Published as often as there is news of sufficient importance to warrant it, "Quick Sheet" is geared for distribution to the membership within hours of the time a news break occurs.

Covering in detail such subjects as executive orders, National Production Act regulations, assignments of responsibilities under the Act, manpower, priorities and allocations, the new publication has proved overwhelmingly popular with Association members.

September 30 Cold Storage Holdings

OPERATORS of public general refrigerated warehouses reported cooler occupancy of 63 percent and freezer occupancy of 74 percent on September 30. Cooler occupancy, down 1 percentage point from last month, was 5 points below average but 3 points above the occupancy level of a year ago this time. Decreased utilization of cooler space was reported in all regions except the New England, Middle Atlantic, and East South Central areas. In these regions occupancy increased 3, 4, and 7 points, respectively, during September. The largest decrease in the utilization of cooler space occurred in the Pacific region where occupancy dropped from 65 to 59 percent.

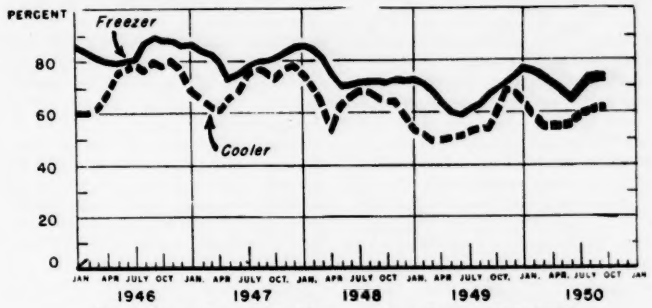
Public freezer occupancy remained the same as last month. There was no change in occupancy in the East South Central region, while decreased utilization of space in the West North Central, West South Central, and Pacific regions was offset by occupancy gains in the five remaining regions. Cities reporting an occupancy of 80 percent or better for both cooler and freezer space were Detroit, Kansas City, Nashville, and San Jose.

During September cooler-held commodities in all types of refrigerated warehouses were increased by 20 percent, while commodities held in freezer storage were increased by 3 percent. This compares with a respective increase of 31 and 2 percent during September of last year. Total weight of both cooler and freezer items on September 30—3.6 billion pounds—was 96 million pounds above average for this time of year, but was 39 million pounds below holdings of September 30, 1949. Cooler and freezer item weights were almost evenly divided with 1.8 billion pounds in each type of storage space. This compares with average cooler stocks of 1.9 billion pounds and freezer commodities amounting to 1.6 billion pounds.

The start of the seasonal movement of apples into storage accounted for most of the net increase in cooler weight during September. The net movement into freezers of fruits, vegetables, poultry, beef, lamb and mutton, veal, and fish amounted to 125 million pounds while withdrawals of the other freezer items totaled 73 million pounds, resulting in a net increase of 52 million pounds for freezer foodstuffs.

National holdings of apples and pears totaled 12 million bushels on September 30 as compared with 19 million bushels a year ago and average holdings of 15 million bushels. Pears in storage, however, were about average for this time of year but not so for apples which were more than two million bushels below the September 30, 1945-49 average.

Seasonal increases in storage holdings of frozen blackberries, blueberries, grapes, peaches, plums and prunes more than countered net withdrawals of other frozen fruit items. During September, total frozen fruit holdings increased by 5 million pounds which was two-thirds less than the increase last year and about four-fifths less than the average September increase in frozen fruit holdings. Nevertheless, total holdings of 467 million pounds exceeded by 111 million pounds last year's stock and



Occupancy of public cold storage warehouses 1946-1950

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	Sept. 30, 1950	Aug. 31, 1950	Sept. 30, 1949	Five-year Average
Meat and meat products, lbs.	406,015	466,263	362,050	373,112
Lard and rendered pork fat, lbs.	58,592	75,496	48,768	71,991
Frozen poultry, lbs.	140,126	105,179	132,380	157,662
Creamery butter, lbs.	232,708	239,398	154,455	117,807
American cheese, lbs.	290,664	287,977	188,259	173,776
Other cheese, lbs.	21,800	22,066	21,530	24,097
Shell eggs, cases	1,568	2,568	810	3,273
Frozen eggs, lbs.	132,497	155,369	121,476	189,932
Apples, bu.	6,597	102	14,777	8,933
Frozen fruits, lbs.	466,522	461,956	355,552	396,925
Frozen vegetables, lbs.	434,789	361,366	368,552	308,049
Frozen fish, lbs.	158,170	153,625	150,608	140,156

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		Sept. 30, 1950 (%)		Aug. 31, 1950 (%)		Sept. 30, 1949 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	2,699	5,104	48	75	45	70	63	75	65	77
Middle Atlantic	37,146	28,885	54	81	50	77	55	68	64	81
East North Central	30,032	27,945	72	72	76	70	65	65	71	76
West North Central	9,507	13,371	78	75	80	80	71	60	76	75
South Atlantic	8,045	6,171	56	73	59	69	50	71	67	77
East South Central	3,569	3,022	83	86	76	86	72	88	78	80
West South Central	8,055	7,559	60	58	61	59	55	47	68	68
Mountain	1,587	1,968	56	79	58	77	56	65	71	83
Pacific	15,492	21,159	59	72	65	76	59	71	69	79
United States	116,132	115,184	63	74	64	74	60	67	68	78

TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent				Net Piling Space (000 Cu. Ft.)		Space Occupied			
			Sept. 30, 1950		Aug 31, 1950				Sept. 30, 1950		Aug. 31, 1950	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	95	112	'68	79	46	80	.....	.....	..	..	..	..
Middle Atlantic	1,493	1,111	56	79	57	79	1,567	282	86	84	86	88
East North Central	3,400	1,590	77	56	75	53	4,737	1,574	84	68	83	68
West North Central	556	2,519	85	78	85	83	15,528	6,580	84	68	85	73
South Atlantic	525	2,533	48	67	4	65	888	218	85	100	85	100
East South Central	.....	.....	..	..	..	..	119	50	100	100	85	93
West South Central	202	31	42	16	43	56	2,525	500	100	100	100	100
Mountain	.....	.....	..	..	..	..	640	391	98	97	98	100
Pacific	2,943	3,327	29	86	62	80	2,835	589	91	89	93	90
United States	9,214	11,223	56	75	63	73	28,839	10,184	87	73	87	77

NOTE:—Blank spaces indicate that insufficient returns were received.

by 70 million pounds the average September 30 inventories.

Frozen vegetables, on the other hand, increased by greater than average amounts during September. Almost 435 million pounds were in storage at the end of last month which was an all-time record high. Except for green peas and spinach, holdings of all of the other frozen vegetable items were greater than a month earlier. The net increase reported during September amounted to 73 million pounds. This was twice the average increase for this time of year and almost 40 percent greater than the net into-storage movement this time last year. Frozen lima beans and sweet corn largely accounted for the net increase in storage holdings. The latter increased by 27 million pounds, the former by 36 million pounds.

Butter in storage totaled 233 million pounds, only 7 million pounds below the all-time high of last month. Nevertheless, for this time of year creamery butter was at an all time high. The previous September 30 high of 232 million pounds was recorded in 1943.

American cheese continued to reach new record storage levels. On September 30, total holdings amounted to 291 million pounds or almost 3 million pounds above the holdings on August 31 which at the time was a new record high for American cheese in storage. The total quantity of cheese in storage on September 30 was 320 million pounds and thus marked a new record high for the quantity of cheeses in storage at any time since records were first kept.

Shell eggs in storage on September 30 were down to 1.6 million cases. This was about half the average supply for this time of year but was about twice the stocks of a year ago. Frozen eggs likewise declined and by the end of last month amounted to 132 million pounds. Withdrawals during September of 23 million pounds were about average but current holdings were below average for this time of year.

Poultry stocks increased by greater than average amounts during September and by the end of the month totaled 140 million pounds. This compares with last year's stocks of 132 million pounds and average September 30 holdings of 158 million pounds. All poultry classifications reflected seasonal net increases with fowls leading all others. By the end of September, almost 16 million pounds of fowls were added to the stocks of a month earlier and total holdings rose to 39 million pounds. Turkey stocks were up to 44 million pounds reflecting a net increase of 6 million pounds.

National supply of meats in refrigerated storages totaled 406 million pounds on September 30, thus reflecting a net withdrawal of 60 million pounds. This time last year, meats in storage amounted to 362 million pounds while average supply for this time of year was 373 million pounds. Commodity-wise, frozen beef increased about 6 million pounds during September to 68 million pounds while stocks of beef in cure remained almost unchanged from a month earlier.

Stores of pork declined 64 million pounds leaving 239 million pounds in storage at the end of last month. These stocks were greater than the holdings of a year ago and the September 30 5-year average. Frozen pork totaled 78 million pounds while other pork amounted to 159 million pounds. For frozen pork, current stocks reflected a net withdrawal of 40 million pounds which was less than the seasonal withdrawal of last year. Stocks of sausage room products reflected slight gains during September as did stocks of lamb, mutton and veal.

National holdings of frozen fishery products totaled 158 million pounds on September 30 of which 124 million pounds were salt-water species. Fresh-water fish amounted to 9 million pounds and shellfish, 25 million pounds. The net change in storage holdings during September was an increase of 4 million pounds which was about average for this time of year.

Storage Outlook

The decline in public cooler occupancy during September was in accordance with the 1945-49 average seasonal change and by September 30, coolers were operating at a level slightly above last year but also below average. Despite record levels of cheese and significant amounts of dried eggs in storage, cooler occupancy was not maintained at the level of the preceeding month. This may be accounted for by the less than average amounts of fresh fruits in storage this time of year.

During September last year, cooler occupancy increased 7 points and in the following month another 8 points to reach the annual high. The peak this year is not likely to be more than 3 points above the current occupancy level should the prevailing 5-year average change obtain during October. Freezer space utilization should continue at about the present level during October as record amounts of frozen vegetables and near record holdings of butter were reported in store at the end of last month. Although public freezer occupancy was only 4 points below average for this time of year they were operating at 7 points above last year's level. By next month freezer occupancy should be at the annual peak with an expected increase of one percentage point over the September 30 operating level.

Frosty Pipe Bites

IT WAS a hot summer day in Alton, Ill., and three-year-old Mark Bury saw a frosty white pipe leading from the Shearburn Ice Cream Co. plant into an ice cream truck. He thought it was ice cream. So he stood on tip-toes to touch his tongue to it. Instead of ice cream, it was a frosted ammonia pipe. Fifteen minutes later, neighbors armed with hot packs thawed the pipe enough to free him from the tongue trap and treat him for minor burns.

INSTALLATION FILE NO. 1011

How to get maximum efficiency with PALCO INSULATION WOOL

COLD STORAGE ROOM COSTS using PALCO WOOL and Redwood lumber

Because initial economy plus practical serviceability recommend frame construction to meet normal requirements for freezer or cold storage rooms, The Pacific Lumber Company presents this handy cost estimating table based on the accompanying material check list. Flameproofed PALCO WOOL Insulation is not only low in initial cost, but provides permanent operating economy through its efficient "K" factor of .255 B.t.u. Particularly suited to cold storage requirements, it is moisture resistant, non settling, repellant to rodents and insects, and odor proof.

COST-ESTIMATING TABLE

Cold Storage Room Construction (1)

DETAIL	Thickness of PALCO WOOL Insulation	Construction Cost pr.sq.ft. inside dimension		
		All Material	Estimated Labor (2)	Total
(3)				
Wall (4)	6"	.74	.38	1.12
"	8"	.79	.41	1.20
"	10"	.82	.44	1.26
"	12"	.88	.47	1.35
Floor	6"	.53	.19	.72
"	8"	.66	.21	.87
"	10"	.72	.23	.95
Ceiling	8"	.65	.28	.93
"	10"	.74	.30	1.04
"	12"	.87	.32	1.19

(1) The Pacific Lumber Company has prepared these figures with great care, but cannot assume responsibility for their accuracy.

(2) Based on union scale wages of approximately 2.25 per hr. for carpenters, 1.60 per hr. for laborers. Figures should be adjusted according to local scales.

(3) If wall is to be built against an existing surface, deduct .20 per sq. ft. for material and .10 per sq. ft. for labor, or total of .30 per sq. ft.

(4) Figure all doors separately.

MATERIAL CHECK LIST

1 PALCO WOOL Insulation—Saferized
2 2"x4" or 2"x8" fir dimension lumber
3 Redwood clear heart grade 1"x4" T&G Pattern #209 for interior and exterior (fir satisfactory)
4 Fir ceiling joists dimensions various
5 Fir sheathing exterior ceiling finish
6 Two layers Brownskin Vapor-seal or Vabar Vapor-Barrier Paper, or one layer Reynolds Metalation
7 Flinkote Odorless Asphaltic Emulsion
8 Spar Varnish (3-coat application)
9 Fir flooring (B & Btr.)
10 Galvanized nails

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Market Information On Frozen Foods

A STUDY of the marketing of frozen foods has been made by the Production and Marketing Administration of the U. S. Dept. of Agriculture. In a report on this study, types of information valuable to the frozen food industry are presented.

Market news information on frozen foods, it states, is meager when compared with news on nonfrozen products. It is rather limited in scope and for the most part follows commodity lines. There are at present three sources of information: the National Association of Frozen Food Packers, the Bureau of Census, and the Bureau of Agricultural Economics.

The only information on the supplies and movement of frozen foods in the marketing channels is that reported by the Market News Services of the Department of Agriculture. Most of this information is gathered collectively rather than along commodity lines.

For the most part price information on frozen foods consists of figures collected by trade journals and some data gathered by governmental agencies in making experimental studies. Figures on consumption or movement of frozen foods are those reported by offices of the Department of Agriculture.

Commercial Pack

The present annual statistics on the commercial pack of frozen fruits and vegetables gathered by the National Association of Frozen Food Packers appear to be adequate. The Department of Agriculture has given these figures quasi-official government status by publishing them in the annual book, "Agricultural Statistics." Also, detailed annual production figures on frozen eggs are now being compiled and disseminated by the Bureau of Agricultural Economics. There remain frozen eviscerated poultry, commercially frozen meat, and frozen specialty items for which there may be a need for strengthening any existing figures so as to show accurately the total quantity frozen.

Supplies deal with the stocks of frozen foods held in substantial quantities in freezer storage space, and with shipments and receipts of these stocks from one area to another. Current information is limited to the figures released in the cold storage report on the holdings in refrigerated storage facilities for periods in excess of 30 days, with a breakdown by package sizes for certain selected items; and to the storage movement of frozen eggs at 35 important markets.

Frozen Food Prices

Frozen food prices, those paid for raw materials and those received by packers and distributors are reported in some detail. For packers the most common method of securing supplies is by contracting with local growers for predetermined varieties and quantities. Since retail display cabinets are expensive, wholesalers have found it necessary to aid retailers in obtaining this equipment. Thus, by furnishing or aiding in the financing of freezer cabinets and demanding special merchandising in return, distributors maintain a degree of control over their products at the retail level. The "price-marking" of frozen food packages before or at delivery gives some wholesalers control over the pricing of their products at the retail store.

This study of the marketing of frozen foods covers information now available on market news information, movement of frozen foods in marketing channels, price information, statistics on commercial packs, stocks held in freezer storage, sales to institutions, and annual estimates of consumption.

Institutional Trade

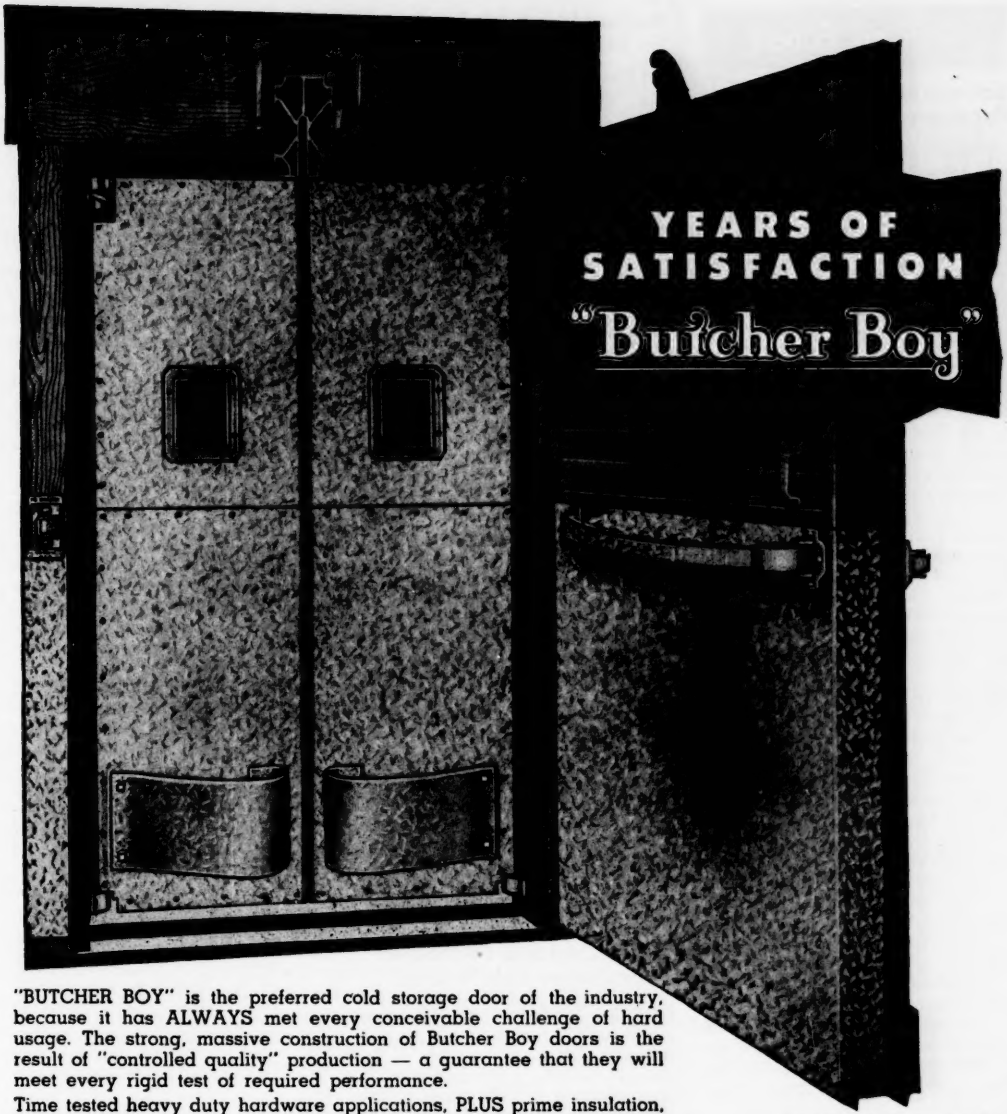
Selling frozen foods to the institutional trade is somewhat different in that not all the services offered retailers are needed by institutional concerns. Since a frozen product loses its brand identity when processed into cooked foods, price can become a more competitive factor. However, wholesale prices of frozen foods are relatively stable and are not subject to large week-to-week changes. as is evidenced by the price lists issued by distributors to both retail stores and institutions. On these lists, most prices stay effective for several weeks, although marked "subject to change without notice." Thus, it would seem that, in the light of present marketing practices in frozen foods and because of the small degree of price fluctuation that takes place for each frozen commodity, there would be little need or demand for price information.

Estimates of Consumption

Annual estimates of the consumption of frozen fruits and vegetables are now being computed by the Bureau of Agricultural Economics by use of data on the annual pack, the storage holdings, and the use by the military. However, before this technique can be carried out to best advantage, the information on the production and stocks of some frozen foods will have to be more inclusive and detailed, particularly on such items as poultry, meats, and specialty goods.

New Quick-Freeze Plant for Processing Shrimp

A QUICK-FREEZE plant capable of processing 20,000 pounds daily is being constructed at the Pascagoula Ice & Coal Co. plant, according to Hermes Gautier, Pascaguola (Miss.), who has bought full interest in the plant. In addition to the freeze plant, a zero temperature holding room with a storage capacity of 500,000 pounds will be installed, with provisions to be made to increase this to 1,000,000 pounds if necessary. The new building, 40 by 47 ft. is expected to be completed in time to process shrimp in November.



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"BUTCHER BOY" is the preferred cold storage door of the industry, because it has ALWAYS met every conceivable challenge of hard usage. The strong, massive construction of Butcher Boy doors is the result of "controlled quality" production — a guarantee that they will meet every rigid test of required performance.

Time tested heavy duty hardware applications, PLUS prime insulation, PLUS 100% Douglas Fir Construction is a resultant product equalled by none — BUTCHER BOY. Write for free bulletins today.

VESTIBULE-TYPE TRACK DOOR

BUTCHER BOY COLD STORAGE DOOR CO.

170 N. SANGAMON ST., CHICAGO 7, U. S. A.

Frozen Foods

Refrigerator Car Tests Made For Lower Temperatures

TESTS are being made by the Fisheries Department of the Canadian Research Council in cooperation with the Canadian Pacific and Canadian National railways to meet a demand for refrigerator-car temperatures below 15 F for transportation of frozen fish and quick-frozen fruits and vegetables. Two experimental cars and a standard refrigerator car were used.

The standard Canadian car is cooled with ice and salt in overhead bunkers extending from end to end of the car. These provide uniform cooling and, even in warmest weather, temperatures of 15 F can be maintained on long hauls.

In one test, one of the experimental cars maintained zero temperatures throughout. It was a Canadian National refrigerator car remodeled internally and equipped with two gasoline-driven refrigeration units. Although the car was a success, one big problem involved the replacement of the gasoline engines by a different type of engine to meet fire regulations. Other problems included the question of maintenance crews and costs and the acceptability of such mechanical equipment on United States routings where Canadian cars must be operated and serviced.

The other experimental car was a Canadian Pacific standard refrigerator car model, cooled with ice and salt, but with new bunkers. This car maintained a temperature approximately five degrees lower than that obtained with the standard bunker.

The Fisheries Department in its report said that previous tests had shown that the addition of 20 percent ammonium nitrate to the salt and ice in the bunkers lowered the temperatures a further five degrees.

Potato is Glamorized as New Frozen Food Product

REFLECTING the growing interest in frozen foods, Look Magazine, issue of November 7, has an article, illustrated with full-page four-color reproduction of frozen French-fried potatoes and frozen mashed potatoes. The articles says in part that frozen French-fried potatoes, warmed in home ovens, appear more frequently on many tables. Potato pancakes are prepared with new ease, thanks to frozen and dehydrated mixes; even mashed potatoes are made without effort from new frozen packages.

Railroads Expect Increase In Frozen Food Shipments

THE country's railroads are planning on an increase of 14 percent in refrigerator car loadings of frozen foods the final quarter of 1950 in comparison with the corresponding months of 1949, according to the Association of American Railroads. The estimates are supplied by the AAR's Car Service Division, after a study of car requirements by the regional Shippers Advisory Boards.

The estimated loadings for the final quarter of the year betoken another all-time record in rail shipments of frozen foods in 1950. Based on estimated loadings for the year to date, a total of 14,148 carloads of these products will be moved by rail in 1950. That compares with actual loadings of 13,118 cars in 1949 and 11,845 cars in 1948.

For the fourth quarter of 1950, the A.A.R. estimates that 4,058 cars of frozen fruits, vegetables and other frozen products will be moved by rail, compared with 3,563 cars moved in the final quarter of 1949. The percentage increase forecast for frozen food movement the final quarter is substantially higher than the increases estimated for canned fruits and vegetables, fresh fruits and vegetables, and citrus products.

The carloading index is considered important as a guide to movement of frozen products from packing and freezing centers to warehouses and into consumer channels. Most of the movement is usually from the Pacific Coast to the middle west and the East, and along the Atlantic seaboard.

Zarotschenzeff Introduces New Frozen Fish Product

NEED for further research in the work of developing new fish products, particularly suitable for the American market was urged by M. T. Zarotschenzeff at Digby, Nova Scotia.

While spending the summer at Digby with his son, W. P. Zarotschenzeff, president of the National Frosted Foods Sales Corp. of New York and head of the Digby Packing Co. Ltd., Mr. "Z" experimented with new fish products and developed a pre-cooked fresh frozen Bouillabaisse which he feels should find a ready market, especially in the United States. This bouillabaisse combines lobster, clams, fish stock with bay leaf, tomato and other ingredients.

Mr. Zarotschenzeff states there are many such dishes which could be made from Nova Scotia fish products that could be pre-cooked, fresh frozen and shipped to the American market.

Fairless Predicts Refrigerator Scarcity

MOUNTING demands for steel may put supplies for refrigerators and automobiles on the "hard to get" list acording to hints dropped by Benjamin F. Fairless, president of the United States Steel Corp., in an address at the annual meeting of the Philadelphia Chapter of the National Association of Purchasing Agents.

The head of "big steel" said that military demands for steel so far have been negligible, but warned that they will increase rapidly in the coming months and will naturally have first claim on the entire steel supply. It is obvious that until new steel-making facilities are built, the government's needs will have to be met out of existing civilian supplies, he said.

Their greatest difficulty today he said, lies in the field of light, flat-rolled products, and it is right in that field where there is already a market scarcity that much of the military demand is going to fall. Light, flat-rolled steel is used heavily by makers of automobiles, refrigerators and home appliances.

Fairless, admitting he might be pessimistic in his views, said the government may make immediate demands for 12,000,000 tons of steel. Such demands, he said, would cut by at least one eighth the civilian supply of sheets, plates and tin plate. He blamed three factors for the shortage: (1) the telescoping of consumer demand; (2) the replenishment of inventories; (3) strikes which have cost the American people twenty-nine million tons of steel production since V-J Day.

An optimistic note was sounded when he said the American steel industry has sufficient capacity to match the output of every foreign steel plant in the world, ton for ton, and still have fourteen million tons left over.

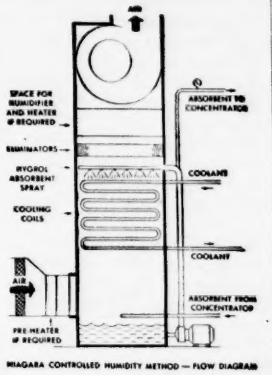
Lectures Compiled on Foundation Engineering

A very thorough discussion of foundation engineering is published in the University of Illinois Engineering Experiment Station Circular Series No. 60. This is a compilation of special lectures on foundation engineering by A. E. Cummings. It is a well illustrated booklet and discusses basic factors in construction of building and other foundations, analyzes difficulties sometimes encountered and tells how to avoid them. The entire subject is presented in rather simple terms.

How You Save with the NEW Niagara Method of Air Conditioning

Using "Hygrol" Hygienic Absorbent Liquid

Because it absorbs moisture from the air directly, the new Niagara Controlled Humidity Method uses less, or no, mechanical refrigeration for dehumidifying. You save first costs and installing of heavy machinery. You save space, maintenance expense, power. Easier, convenient operation.

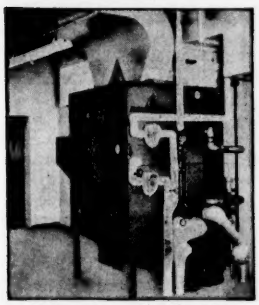


NIAGARA CONTROLLED HUMIDITY METHOD — FLOW DIAGRAM

Using "Hygrol" hygienic absorbent liquid, this method gives complete control of temperature and relative humidity. Especially, it is a better way to obtain dry air for drying processes, packaging hygroscopic materials, preventing moisture damage to metals, and obtaining better quality for chemical process products and food products—or in obtaining better results in comfort air conditioning for office or laboratory at lower refrigeration costs.

The diagram shows how filtered air is dehumidified by passing thru a spray of "Hygrol"— a liquid absorbent which removes air-borne moisture. This liquid is hygienic and non-corrosive; it contains no salts or solids to precipitate and cause maintenance troubles. It is continuously reconcentrated at the same rate at which it absorbs moisture, providing always the full capacity of the air conditioner, automatically.

Food Packaging under Controlled Humidity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Units provide a range of capacities from 1000 to 20,000 C. F. M. Multiple unit installations are in use successfully. Records of results are available.

For further information, write to Niagara Blower Company, Dept. IC 405 Lexington Ave., New York 17, N. Y.

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Barrett* **STANDARD ANHYDROUS AMMONIA**

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American Society Refrigerating Engineers Annual Meeting in New York

THE 46th annual meeting of the American Society of Refrigerating Engineers will be held in New York City from Sunday, December 3, through Wednesday, December 6, 1950. All events of the meeting, except for inspection trips and sightseeing expeditions, will be held at the Hotel Commodore, conveniently located near Grand Central Terminal in midtown Manhattan.

Technical sessions and specialized conferences will start Monday morning, the 4th, while meetings of the various ASRE committees will begin on Sunday. The registration desk at the Commodore will first open at noon Sunday. Everyone interested in refrigerating engineering, whether members of ASRE or not, are welcome to attend.

A particularly intriguing program, both for its technical merit and its general interest, has been arranged and includes such well known national figures as Dr. Clarence A. Mills, professor of experimental medicine at the University of Cincinnati, and Vilhjalmur Stefansson, world famous arctic explorer and author.

Important Speakers

Dr. Mills, who for many years has made a study of environmental conditioning, will describe "Reflection Point," his new home in Cincinnati, in the construction of which is incorporated many of his revolutionary ideas and applications of radiant heating, air conditioning, and the principles of reflectivity. To complement this paper, the program committee is arranging a paper, by a prominent engineer, on installation of a conventional air conditioning system in an old building.

Mr. Stefansson, speaking at the welcome luncheon (traditional event at ASRE meetings scheduled for Monday noon) will discuss "Natural Cold Storage,"—how the permanently frozen ground of arctic regions can be utilized to advantage, and some of the problems which arise. With a wide background of arctic living and study, Mr. Stefansson will present a talk of great interest to both the refrigerating engineers and ladies attending the luncheon. Currently, Mr. Stefansson is editor of the 20-volume *Encyclopedia Arctica*, a tremendous undertaking which will weave together all significant information on the arctic contributed by hundreds of arctic authorities.

Plenary technical sessions of the convention will be held Monday, Tuesday, and Wednesday mornings, when authorities in their fields will present papers on a variety of subjects, ranging from refrigeration's place in food processing to such basic engineering matters as the application of the restrictor tube as an expansion device and the proper selection of lubricants for low temperature applications. A paper describing for the first time Servel's new 20-ton absorption air conditioning system is also promised. Detailed program will be announced at a later date.

In addition, conferences on specialized aspects of refrigerating engineering are planned. The Domestic Refrigerator Engineering Conference, a popular feature of recent meetings of the Society, will be directed by Walter A. Kuenzli, head cabinet engineer of Servel, Inc. A symposium of papers on the Heat Pump is being arranged by C. H. Coogan, professor of mechanical engineering at University of Connecticut. Room Air Conditioners is the subject of another symposium planned by M. C. Terry, chief engineer of Philco Corp.

Arthur J. Hess, member of the Los Angeles engineering firm of Hess-Greiner & Polland and a director of ASRE, is in charge of the technical program for the meeting.

New York Section Host

Other arrangements for the meeting are in the hands of the New York Section of ASRE under the direction of Fritz Honerkamp, chief engineer of Anemostat Corp. of America. His convention committee is made up of the following committee chairmen: Gene Shepard, vice chairman; I. J. Fajans, reception; J. A. Swain, inspection; A. Eriksen, finance; Lee Babin, banquet; A. I. McFarlan, information; T. R. Kearney, Monday night entertainment; and Mrs. Honerkamp, ladies committee.

As host to the national membership of ASRE, the Section will conduct inspection tours of such local installations as the air conditioning system of the United Nations Secretariat Building, and of the New York Steam Company. In addition, the social program the Section is planning for both the convening engineers and their lady guests includes an informal Gay Nineties party on Monday evening, and a cocktail party and dinner dance Tuesday, December 7.

Chicago Section A.S.R.E. Monthly Meeting

THE Chicago Section of the American Society of Refrigerating Engineers held the first meeting of the season September 14 at the Builders Club, with an attendance of 72 members and guests.

After the usual social hour and dinner, Chairman Neff announced that the section was honored by the presence of five visiting guests who he introduced as follows: S. A. Andersen, Royal Technical University, Copenhagen, Denmark; Luciano Dell'Orto, Dell'Orto, Milan Italy; Baltzar Jacobsson Stockholm Breweries, Stockholm, Sweden; Rudolf Plank, University of Karlsruhe, Karlsruhe, Germany; Otto Wagner, Linde Company, Wiesbaden, Germany.

Messrs. Andersen and Plank each reported on their work in this country in connection with the Economic Cooperation Administration to increase production and cooperation between their countries and the United States. Messrs. Dell'Orto, Jaccobsson and Plank are members of A.S.R.E.

Membership Chairman Hansen, reported on the acceptance of 19 new members since last meeting.

Program Chairman, Eichstaedt, listed the program and speakers which he had obtained for the season, and this program should be very interesting and constructive.

Attention was requested by the secretary in obtaining the correct address of the members for section roster which is in the process of printing.

Chairman Neff read an invitation from the Cincinnati Section to attend an inspection of Dr. Mills residence in Cincinnati September 22. This residence is conditioned throughout by reflective radiant conditioning.

The speaker of the evening, J. E. Watkins of Midwest Engineering & Equipment Company, made a very excellent presentation of refrigerant recirculating systems. Mr. Watkins' paper covered the automatic control and re-circulation of liquid ammonia from the suction accumulator to the ammonia liquid system, providing for flooding the evaporators without liquid carryover to the compressor; thereby increasing the efficiency of the evaporators with a lower condensing pressure and with resultant power saving. The paper was illustrated with slides, showing the arrangements and operation of the system and charting the operation advantages.

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ARMOUR'S ANHYDROUS AMMONIA

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Remember, too, that fast shipment is an Armour byword. In fact, many customers receive their Armour's Anhydrous Ammonia the day it is ordered. 65 conveniently-located stock points are your assurance of receiving prompt shipment of Armour's Anhydrous Ammonia in either 50, 100 or 150 pound cylinders where you want it, when you want it and fast.

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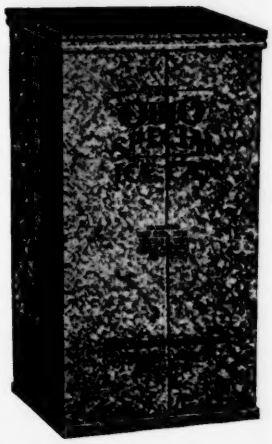

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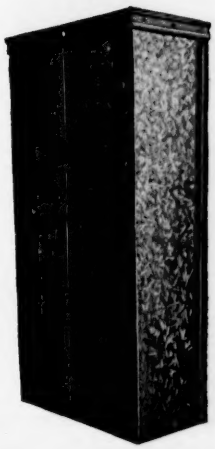

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NILES — *Established 1902* — OHIO

Maintaining Cold Lines

(Continued from page 16)

are three common types of outdoor finishes: asphalt saturated felt, Insulmastic, and weatherproof plastic. Maintaining saturated felt is very similar to the method used for asphalt painted indoor lines. Wires and straps must be inspected and repaired the same as for indoor covering. Voids are also treated with steam filler in the same way, and a yearly painting with cork covering paint is recommended. The chief difference is to be sure that the felt on outdoor lines is sufficiently lapped and in the right direction to form a watershed. Also, extra care should be taken in painting to make certain that the paint seals thoroughly all laps in the felt.

With either an Insulmastic or a weatherproof plastic finish yearly painting may not be necessary. These finishes may be painted with cork covering paint only periodically as needed. However, a yearly inspection to check the condition of the finish and to look for damage is certainly advisable. Damaged sections of a job finished with Insulmastic should be repaired with Insulmastic. If the breaks extend into the wire mesh, the mesh should be patched also. Likewise in the case of jobs finished with weatherproof plastic, voids should be patched with weatherproof plastic, and if the fabric is damaged it should be replaced. Of course, after patching, in both cases, the damaged area should be given a coat of cork covering paint.

That is about all there is to the maintenance of cold lines and equipment, but it pays big dividends if the procedure is carefully followed.

Motors

(Continued from page 18)

7—Protect disassembled bearings from dirt and moisture.

8—Use clean lint-free rags if bearings are wiped.

9—Keep bearings packed in grease and wrapped in oilproof paper when being stored.

10—Clean the inside of the housing before replacing bearings.

11—Keep bearing lubricants clean when applying and cover containers when not in use.

Starters

The motor starter should be in a dry location and if the atmosphere is dusty, covers should be provided to help keep operating parts in best working order. A piece of very fine sandpaper brushed lightly over relay and push button contacts will keep them clean and insure a good contact. Most main contactors have silver coated contacts and these should be filed sparingly to smooth any very rough parts which might cause sticking. The condition of circuit breaker oil can be judged by feeling the amount of carbonized deposit in the bottom of the tank. The life of the oil depends on the number of motor operating cycles.

If the starter should be of the open back type, a screened fence will be necessary to provide protection for personnel. Guards around all pulleys, belts, and other moving parts are a must. It is also for reasons of safety that all motor frames be adequately grounded by connection to a metallic underground water piping system. The grounding of equipment and other protective measures should be regularly inspected and maintained. It contributes to longer life of personnel as well as equipment.

Before you shelves requests for expenditures on a planned maintenance program, including needed tools, be sure you have considered the possible loss due to reduced production and the cost of replacing present equipment at present day prices. Then go ahead with the maintenance.

Reference has been made several times to the motor manufacturer as a source of information and assistance. This service can be quite valuable and in many cases a representative is as close as the telephone. Make use of this aid to your maintenance program and obtain the longest possible life from your motors.

Checking Heat Exchanger Tubes

(Continued from page 14)

ment quickly learn to distinguish the flaws of any importance which the instrument detects. The records made during inspections can be preserved for comparison with records made later. Thus it is possible to keep account of the trends in the tubing and approach rather close to charting the actual useful life. This method of accurate inspection also permits reuse of any portion of a tube shown to be without significant flaw or deterioration .

Fair Uses 500 Tons of Ice

ENOUGH ice was consumed at the California State Fair held at Sacramento early in September to supply the average family for 166 years. About 500 tons of ice were used by beverage concessions, food refrigerating units and drinking fountains, compared with 350 tons last year.

Sales and Reorganizations

St. Simon, Ga.—SeaPak Corp, and AeroFoods, Inc. have merged and the name of the resultant company is SeaPak Corp. Both firms occupy buildings at McKinnon Field.

Vincennes, Ind.—The Ebner Ice and Cold Storage company has sold its Double Cola division to a new firm which is headed by Kenneth Snapp.

Lewiston, Me.—Stein & Co., Chelsea, Mass., has purchased the property of the Lake Auburn Ice Company who will continue operations until the end of 1951 in adjacent buildings.

Rochester, N. Y.—The good will and business of the 78-year old Hetzler Bros. Ice Company has been sold to Rochester Ice, Inc. Originally established by George Hetzler, the business was carried on by three sons, Frank, John and Leo.

Watertown, N. Y.—The Northern Ice Co. Inc., 465 Martin St., has offered its plant and ice-making equipment for sale. The firm's president, W. W. Claxton, said that until such time as a sale could be arranged the company would continue to produce and sell ice. The plant has a 50-ton capacity and produces an average of 7,500 tons a year.

Fires and Accidents

Covington, Ky.—A number of Covington firemen responding to a fire alarm at the Blue Grass Provision Co., 12th and Fisk Streets, were made ill and nearly overcome when "smoke" boiling from the building turned out to be ammonia vapor. The leak came from a hose which broke as a refrigerator truck was being replenished with the ammonia supply.

Bowling Green, Ky.—Fire recently destroyed a large portion of the Bowling Green Ice Company plant located a half mile north of the city. No estimate of the loss was available. The ice manufacturing part of the plant was a total loss.

Lawrenceville, Pa. — Sparks from acetylene torches set cork insulation ablaze at the vacant Consolidated Ice Company plant, Forty-third Street and Allegheny Valley Railroad.

New Incorporations

Binghamton, N. Y.—Articles were filed with the office of the Secretary of State, Albany, N. Y., for Cutler Ice Company changing the capital stock from $100,000 to $200,000. Lloyd C. Anderson was the attorney who filed the papers.

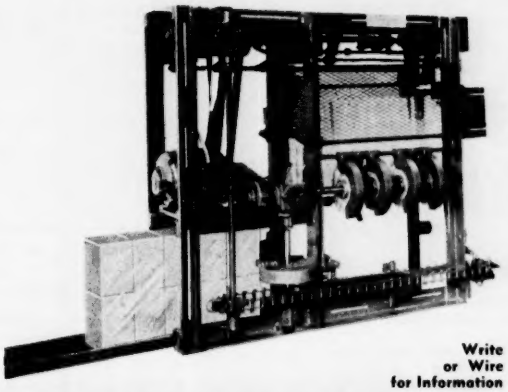
Rochester, N. Y.—Articles were filed with the Office of the Secretary of State at Albany, N. Y. recently for Hetzler Brothers Ice Co. Inc., changing the name to Hetzler Brothers Holding Corporation. Sutherland and Sutherland, attorneys, filed the papers.

Dallas, Tex. — The Southern Ice Stores here have been incorporated with $1,000 capital stock by F. W. Beazley, Jr., E. A. Capers and F. P. Sebastian.

LOWEST PRICED
Heavy-Duty Scoring Machine

The Perfection-Made
MILLER

Scoring Machine is the lowest priced, completely automatic, Heavy-duty Scoring Machine on the market. Hundreds of Miller machines are in use all over the country and have been for many years.
Like all other Perfection products, the MILLER is sturdy, fast, economical in operation and maintenance.



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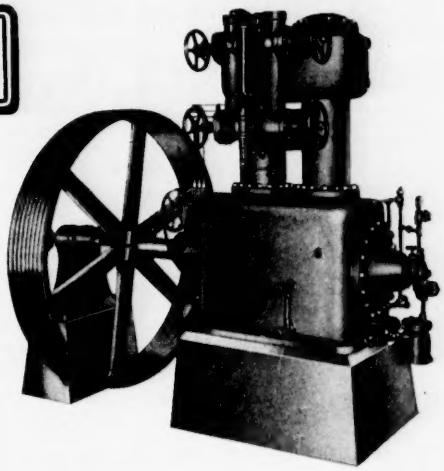
Sterling DEPENDABLE REFRIGERATION



The phrase "STERLING DEPENDABLE REFRIGERATION" is more than a slogan—it's a fact.

Built with rugged strength for endurance, with advanced design for efficiency and economy of operation, STERLING Ammonia Compressors are the product of more than fifty years of "know how" in the manufacturing of refrigeration machinery and equipment.

A complete range of sizes insures the correct compressor for each application.

Deliveries are, at present, current—most models of compressors are available from stock.

For complete information, see your nearest STERLING distributor, or write the factory.

REYNOLDS MANUFACTURING CO.
SPRINGFIELD *"Builders of Fine Refrigeration Equipment"* MISSOURI

CONVENTION CALENDAR

ALL INDUSTRY EXPOSITION
November 5-8, 1950
Navy Pier, Chicago, Ill.
GEO. MILLS, Director

CANADIAN ASSOCIATION OF ICE INDUSTRIES
November 7-9, 1950
Chateau Frontenac Hotel,
Quebec City, Canada
MRS. MILDRED CROFT, Secretary

DELTA STATES ICE ASSOCIATION
November 13-15, 1950
Hotel Marion, Little Rock, Ark.
R. N. MILLING, Secretary

ILLINOIS ASSOCIATION OF ICE INDUSTRIES
November 27-29, 1950
Abraham Lincoln Hotel, Springfield, Ill.
WM. WRIGHT, Secretary

NATIONAL ASS'N. PRACTICAL REFRIGERATING ENGINEERS
November 28-December 1, 1950
Hollywood-Roosevelt Hotel,
Los Angeles, California
EMERSON BRANDT, Secretary

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS
December 3-8, 1950
Commodore Hotel, New York, N. Y.
M. O. TURPIN, Secretary

CALIFORNIA ASSOCIATION OF ICE INDUSTRIES
December 4-5, 1950
Fairmont Hotel, San Francisco, Cal.
JACK L. DAWSON, Exec. Mgr.

SOUTH CAROLINA ICE MANUFACTURERS ASSOCIATION
December 11-12, 1950
Columbia, S. C.
GEORGE L. ENGLISH, Secretary

MISSOURI ICE MANUFACTURERS ASSOCIATION
January 8-10, 1951
Hotel President, Kansas City, Mo.
V. A. ESPHORST, Secy-treas.

OKLAHOMA ASSOCIATION OF ICE INDUSTRIES
January 21-23, 1951
Biltmore Hotel, Oklahoma City, Okla.
HARRY T. HUDSON, JR., Exec.-Secy.

THE REFRIGERATION RESEARCH FOUNDATION
February 2-4, 1951
Statler Hotel, Boston, Mass.
H. C. DIEHL, Director

AMERICAN WAREHOUSEMEN'S ASSOCIATION
February 5-8, 1951
Statler Hotel, Boston, Mass.
WM. DALTON, Executive Secretary

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
February 5-8, 1951
Statler Hotel, Boston, Mass.
WM. DALTON, Executive Vice-pres.

FACT FINDING CONFERENCE
February 11-13, 1951
Kansas City, Mo.
CLIFF CARPENTER, President

SOUTHWESTERN ICE MANUFACTURERS' ASSOCIATION
February 14-16, 1951
The Hotel Galvez, Galveston, Tex.
P. A. WEATHERRED, Secy.-Counsel

GEORGIA ICE MANUFACTURERS ASSOCIATION
February 21-22, 1951
Ansley Hotel, Atlanta, Ga.
RICHARD W. FLORRID, Secretary

SOUTHERN ICE EXCHANGE
February 21-22, 1951
Ansley Hotel, Atlanta, Ga.
RICHARD W. FLORRID, Secretary

OHIO ASSOCIATION OF ICE INDUSTRIES
February 25-27, 1951
Deshler-Wallick Hotel, Columbus, O.
GUY W. JACOBS, Secretary

MICHIGAN ICE INDUSTRIES ASSOCIATION
March 1-2, 1951
Detroit Leland Hotel, Detroit, Mich.
EDWARD JACKSON, Secretary

INDIANA ASSOCIATION OF ICE INDUSTRIES
March 4-7, 1951
Lincoln Hotel, Indianapolis, Ind.
ROBT. W. WALTON, Secretary

ASSOCIATION DIRECTORY

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H. T. McDermott, Gen. Secretary, 433 N. Waller, Chicago 44, Ill.

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Wm. Dalton, Exec. Vice-Pres. Tower Bldg., Washington 5, D. C.

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W. T. Good Ice Co., Lincoln, Nebr.

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Alexandria, Va.

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Diamond Ice & Coal Co., Charleston, W. Va.

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Automatic Bateman Loader Crusher makes one-man operation possible . . . saving time and labor. Hopper slide holds five 50-lb. blocks of ice. Operator replaces empty bag while other bag is being filled, and has time to keep hopper loaded.

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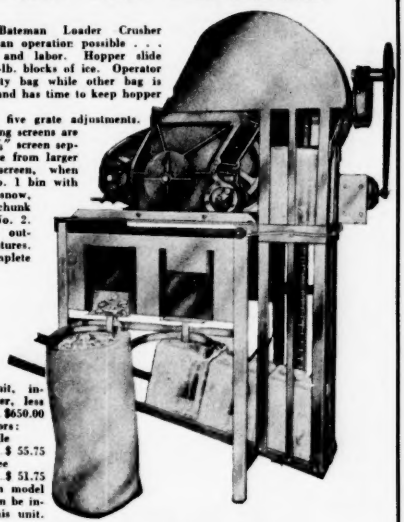

Complete unit, including bagger, less motor $650.00
Crusher Motors:
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Any Bateman model 50 crusher can be installed on this unit.

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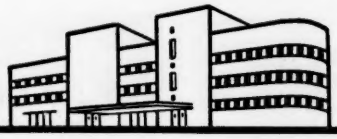
NEW PLANTS and IMPROVEMENTS



This Department each month presents the more important developments covering new constructions, as well as additions, improvements, remodeling, and installations of new equipment in ice and cold storage plants and other industrial plants that use refrigeration. News notes on all such new constructions and improvements are invited.

California

Boulder Creek, Calif.—Cress Service Station has installed a new S & S Model 20-A ice vending station.

Los Angeles, Calif.—The Union Ice Company has installed two new S & S self-contained ice vending stations.

San Francisco, Calif.—Two refrigeration units with a total storage capacity of 2600 cubic feet, are being installed at San Francisco's Foreign Trade Zone, James Campbell, zone superintendent, revealed recently. The refrigerators, the first to be installed in any of the United States' five seaport free trade zones, will be used to store hams, cheese, and other imported perishables. Foreign ships also may use the units.

South San Francisco, Calif.—Swift & Company has been issued a $500,000 permit for modernization of the local plant. Work is already under way.

Florida

Tampa, Fla. — Plantation Foods, Inc., Uleta, has opened a Tampa plant at 716 Meridian Ave. This company manufactures "diced cream" which it introduced to Greater Miami last winter, an account of which was given in the June issue of ICE AND REFRIGERATION.

Georgia

St. Simon, Ga.—Plans have been laid for an immediate increase in SeaPak Corporation's processing equipment. Contracts have been signed for the installation of a large-scale continuous quick freezer, the first unit of which is expected to be in operation by the middle of this month. The new freezer will be of the cold-blast tunnel type and will boost the company's total freezing capacity to almost a million pounds per month. Additional sub-zero storage for frozen seafoods will also be constructed.

Idaho

Blackfoot, Idaho—The State Board of Examiners recently approved a contract with C. B. Lauch Construction Co. of Boise for construction of a cold storage addition to the utility building at State Hospital South, here. The company submitted a low bid of $143,400.

Iowa

Atlantic, Iowa—Tylers Ice Co. has completed installation of a new S & S ice vending machine.

Louisiana

Alexandria, La.—A new Sturdy-Built ice vending depot has been installed by Ice Service Delivery Co. of this city. The unit was supplied by the F. B. Dickinson Company of Des Moines, Iowa.

Baton Rouge, La. — Ice Service Company has installed four additional S & S ice vending units to serve the local trade twenty-four hours every day. F. B. Dickinson & Company supplied the units.

Missouri

St. Louis, Mo.—City Products Corp. has installed four additional S & S ice vending machines to serve the local trade.

New Mexico

Los Alamos, N. Mex.—Los Alamos locker plant has just installed three S & S ice vending machines and one 16 ft. station here. Equipment was supplied by S & S of California.

Santa Fe, N. Mex.—Todd Ice Co. has installed a third S & S ice vending station in this area. Both packaged and block ice are now readily available to townspeople.

New York

Binghamton, N. Y.—Cutler Ice Co. is now merchandising processed packaged ice by means of newly installed S & S ice vending equipment.

Niagara Falls, N. Y.—Cataract Ice Co. is now serving packaged cubed ice through newly installed S & S ice vending machines.

New York, N. Y.—The American Ice Company has sold to the McPhilben Manufacturing Company the one-story building occupying a plot 240x100 ft. at 1329-1355 Willoughby Street, Brooklyn.

Ohio

Findlay, Ohio—The Krantz Brewing Corp. is engaged in a $200,000 expansion and remodelling program which includes a new brick building to provide additional storage space.

Oklahoma

Oklahoma City, Okla.—The Harris Meat and Produce Co. is building a modern meat packing plant at Reno.

Sapulpa, Okla.—The Miller Packing Company, located just off Highway 66 in the old Red Ball buildings has been completed.

Oregon

Eugene, Ore.—Crystal Ice & Storage Company recently established an S & S self-contained ice vending station.

Portland, Ore.—City Ice Company has established another S & S self-contained ice vending station equipped to dispense both block and bags of prepared ice.

Pennsylvania

Middletown, Pa.—Making 24-hour service their rule, Middletown Ice & Coal Co. recently installed S & S ice vending machines at the plant.

Texas

Amarillo, Tex. — Plans are announced by the Amarillo Ice Company to build a $150,000 cold storage plant. Manager Charles Lamka asked permission to build a loading dock extending over part of a street right-of-way. Plans, still in the preliminary stage, call for a building 230 feet long and 100 feet deep. The plant when completed is to be used by the Sides Fruit Company. The commission granted tentative permission to the company to build the loading dock, pending a check of utility installations.

McGregor, Tex. — The McGregor Ice Company has installed a new S & S ice vending machine for dispensing 25 lb. bags of prepared ice.

Victoria, Tex.—The Victoria Ice Company, in addition to the two model No. 16 Polar venders mentioned in the June issue of ICE AND REFRIGERATION, now has a new Polar storage cabinet for ice.

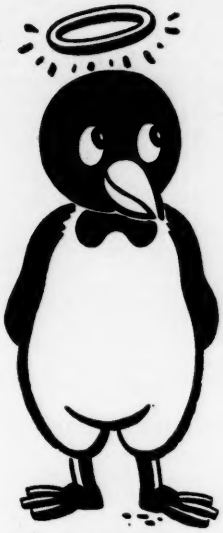
Washington

Cashmere, Wash.—Cashmere's fine new Fruit Grower's Union warehouse and cold storage plant has been completed. It is located on a site south of the Great Northern Railroad and east of Vine Street, and replaces the building destroyed in a fire last fall. Plans for the new construction were reported in the April, 1950 issue of ICE AND REFRIGERATION.

Spokane, Wash.—Beewar Produce Company is constructing a new meat processing plant at Freya and Alki, the building to be 75 by 80 feet and of reinforced concrete.

Icy Item

Lake Charles, La.—Pure Ice Company, Inc., filed notice of dissolution of its charter of incorporation with the office of the Secretary of State at Baton Rouge, La., recently.



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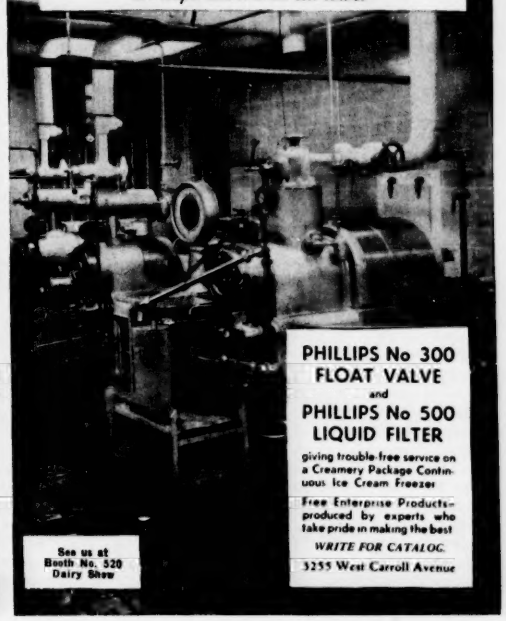

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DEATHS

Willis H. Carrier

UNERAL services were held in Buffalo, N. Y., October 10 for Dr. Willis Haviland Carrier whose death occurred Saturday, October 7, at the Cornell Medical Center of the New York Hospital. Dr. Carrier, who was 73 years old, during his lifetime had earned an undisputed reputation of being the founder of the air conditioning industry.

For many years chairman of the board of Carrier Corporation, and later chairman emeritus, Dr. Carrier was active as a scientist and engineer in the air conditioning and refrigeration field for half a century. During the last few years of his career, however, he devoted himself principally to writing and to advising the scores of skilled engineers he had trained to carry on his work.

Willis H. Carrier

He was a prominent member of the American Society of Mechanical Engineers and was awarded the gold achievement medal of that organization. He served as president of both the American Society of Heating and Ventilating Engineers and the American Society of Refrigerating Engineers and was awarded two other gold medals for his pioneering work in the exact control of temperatures and humidity in enclosed areas.

He was the American representative at the World Engineering Congress in Japan in 1930 and in 1940 was selected as a "Modern Pioneer of American Invention" by the National Association of Manufacturers. In 1947 he was one of three Americans invited to address the centenary celebration of Britain's Institution of Mechanical Engineers.

Dr. Carrier was interested primarily in the engineering, development and research phases of the industry he founded, and in training younger engineers. He did not choose to devote any large part of his time to the business operations of Carrier Corporation.

He developed and installed the world's first scientific air conditioning system in 1902. As a project engineer for the Buffalo Forge Company, Buffalo, N. Y., he was given the job of solving the temperature and humidity problem that had interfered with the summer operations of the Sackett-Wilhelms Lithographing and Publishing Company of Brooklyn, New York.

The equipment he devised for this first installation was so cumbersome and complicated that he immediately started a search for a better method. The idea that led to a solution came to him one autumn night when a cold, heavy fog enveloped the station in which he was waiting for a train. He figured that if he could produce an artificial fog in a stream of air and control the temperature of the fog, he could "wring" the water from the air at will.

By 1905 he was able to announce the invention of the spray-type air conditioner. A number of pioneering installations followed; the first in a glue factory that needed drier air and in a textile mill that had to have exact control of humidity. This system was capable of heating, cooling, humidifying and dehumidifying and with a number of refinements it still stands today as one of the most efficient types of apparatus available for air treatment. The whole vast science of air conditioning actually started with this spray-type air conditioner.

The invention and development of the dew-point control system followed and in 1907 he patented the Differential Thermostat and Differential Hygrostat. After five more years of research among the factors related to the dehumidification of air through mechanical refrigeration, he presented to the American Society of Mechanical Engineers his "Rational Psychrometric Formulae." This paper delivered in 1911, disclosed for the first time the laws of psychrometry. In 1919 he perfected his previously published Psychrometric Chart which stands today as the final authority on the subject.

In 1907, Dr. Carrier and a group of his colleagues formed the Carrier Air Conditioning Company of America as a subsidiary of the Buffalo Forge Company. He was the guiding genius of the engineering and research division of the new company. In 1915, the Buffalo Forge Company decided against further activity in the engineering phases of the air conditioning and refrigeration business, so the Carrier group established their own independent company—Carrier Engineering Corporation. Later, when the company combined engineering with the large-scale manufacture of air conditioning and refrigeration apparatus, the name was changed to its present form—Carrier Corporation.

One of Dr. Carrier's most important contributions to the science of air conditioning was his invention and design of the centrifugal refrigeration machine. It represented a tremendous advance over the reciprocating machine, particularly where large tonnages of cooling were required. Announcement of the 2,000th such unit to be produced by Carrier Corp. was published in the October ICE AND REFRIGERATION.

Dr. Carrier was born in Angola, N. Y., November 26, 1876. He was the descendent of an English political refugee, Thomas Carrier, who migrated to America upon the restoration of Charles II. He attended various district schools in Erie County, New York, Central High School in Buffalo, New York, and was graduated from Cornell University in 1901. For many years he was a member of the Cornell Board of Trustees.

Edward H. Culliton

THE death of Edward H. Culliton, a pioneer Buffalo ice manufacturer, occurred in Buffalo General Hospital Oct. 14 at the age of 72 years. Mr. Culliton and his brother, Louis R., founded the Culliton Ice Company in 1914, a company which now includes three local plants. He was president when he retired four years ago. The two brothers first entered the ice business in 1906 at Lake Chautauqua, starting the People's Ice Company and shipping lake ice to Buffalo. In addition, they established the Wayne Ice Company at Erie, Pa., in 1928. One of their enterprises was the Culliton Ice Cream Company, which the pair conducted from 1914 to 1923. The firm sold its interests to the Rich Ice Cream Company.

He is survived by three sons: Edward H. Jr., James R. and William.

Emil H. Mack

THE death of Emil H. Mack, 61, assistant sales manager of the Vilter Manufacturing Co., Milwaukee, Wis., producer of refrigeration and air conditioning equipment, occurred October 11 in a Milwaukee hospital. A native of St. Charles, Mo., Mr. Mack had been associated with the Vilter company for 40 years. He was a member of the Engineers' Society of Milwaukee and of the Refrigeration Engineers' Society of Milwaukee. Surviving are his widow, Mrs. Edie Mack; and a son, Willard Mack of Madison, Wis.

SOREN THURSTENSEN, chief engineer for the Henry Vogt Co., Louisville, Ky., for 30 years, died September 27 at his home in Pensacola, Fla., where he moved about two years ago after retiring. He was 86 years old. Mr. Thurstensen developed and held several patents on high pressure machines and designed and supervised construction of numerous ice and cold storage plants in the South.

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18 Armstrong Purgers for the Southern Ice Co., 6 for the Commercial Ice & Produce Co., 8 for the Union Ice Co., 6 for the City Ice Co., 5 for the Railway Ice Co.—typical evidence that Armstrong Purging pays off by keeping systems free of air and other non-condensables.

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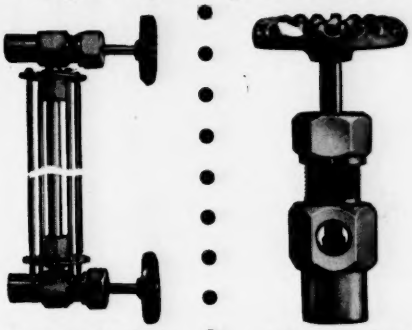

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Packaged Ice Preserves Pre-Packaged Produce

MOST processing plants that prepackage such perishables as mixed salads, cole slaw, and spinach can't handle them during the hot weather, due to the lack of a low cost, efficient method of keeping the temperature of the prepackaged produce at a safe level until it reaches the retail store. For after prepackaging these processed produce items in transparent film bags, they are usually placed in corrugated master cartons. These cartons often are shipped by unrefrigerated trucks to a central warehouse. Here they are transferred to route trucks (unrefrigerated) for shipment to retail stores. By the time the packages arrive at the stores, the heat build-up and produce deterioration has begun.

An economical and efficient method of refrigerating the produce during transit has been evolved. The Research and Development Department of the Atlantic Commission Company and the Union Bag and Paper Corporation worked together to solve this problem. Their solution took the form of a specially constructed ice bag which was placed in the carton between layers of the transparent film bags. Made from 50-lb. Kraft paper, the bag is coated with polyethylene on the inner side of the sheet. After filling with 5 pounds of ice, the bag is closed on a regular heat sealer without any adaptations or machine changes. The bag is then placed in the master carton.

During transit, the ice naturally melts. The bag, however, contains the water, thus keeping the packages and master carton from disintegrating. And all this time, the ice and then the melted water constantly absorb the heat from the produce.

These ice bags also offer another feature. In those retail outlets not equipped with refrigerated counters, the bags can be placed overnight in the frozen food lockers to refreeze the water. Next day they can be placed on the produce counters with the packages displayed on top of them. Produce deterioration is held off for that much longer.

Commercial shipments made with these specially developed ice bags have proven highly successful.

Sequence of photographs shows how new produce ice bags are used. 1—Five pounds of ice is loaded into bag. 2—The ice bag is sealed on a standard rotary type heat sealer with a single foldover. 3—Packer places a layer of six transparent film packages in bottom of corrugated container. (Two rows of 3's) 4—Ice bag is placed over this bottom layer of packages. Another layer of six packages goes on top of the ice bag. (All 12 packages have direct contact with the ice.) The corrugated container is then closed ready for shipment.

New Scoring Machine

A NEW ice scoring machine, equipped with an upender and featuring simplicity of operation, is being made available to the ice industry by the Bateman Foundry and Machine Company of Mineral Wells, Texas. The new unit is to be displayed at the Chicago convention of the National Association of Ice Industries.

It will score up to four 300-lb. blocks of ice a minute and deliver the scored blocks either on end or lying down. When a block of ice is in the elevator, the machine is put into operation by a push-button and stops automatically when the block is scored and ejected. The button must be pushed for scoring each block, and a special safety arrangement prevents machine from starting before the block of ice is in proper position, even though the button is pushed.

All gears in the unit are enclosed, and working parts are in special grease prepared for cold temperatures. Slow moving parts are on roller bearings; fast operating parts

QUALITY COILS FOR *ALL* APPLICATIONS

WELDED HEADERS, PIPE BENDS AND AMMONIA RECEIVERS

Whether your next job be for a single bend, or coil or complete piping system, Chicago Nipple can supply your requirements. Experienced workmen, practical engineers, and modern equipment reflect the quality of our products.

Coils are of selected ammonia pipe—all joints are electrically welded—checked under water with an air pressure of 300 pounds to guarantee tightness.

SEND DRAWING OR BLUE PRINT FOR QUOTATION

CHICAGO NIPPLE MFG. CO.
1997 Clybourn Ave., Chicago 14, Ill

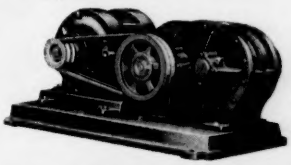
Head Pressure REDUCED by 50 lbs.

Carnation Company
December 26, 1947
Rex Engineering & Sales Co.
Oklahoma City, Oklahoma
Gentlemen:
Referring to your letter of December 18th will say we are very well pleased with the Rex Air Purger recently purchased and installed at our Ice Cream Plant.
We have reduced our head pressure by fifty pounds.
We are now installing a smaller size Rex Purger in our Fresh Milk Unit.
Yours very truly,
Edward A. Bennett, Chief Engineer

REX AIR PURGER

Here's proof of actual results with a Rex Air Purger. When you purge your refrigeration system of non-condensable and permanent gases you reduce head pressure and lower power costs. Investigate today—Write Dept. IR.

REX ENGINEERING & SALES CO.
Oklahoma City, Oklahoma
BOX 5141



Get Dependable Air Volume ...Install R-C BLOWERS

Dependability—as a result of these advantages—has made R-C Blowers the choice of ice plant operators.

- Ability to deliver . . . at pressures you need and want . . . constant and positive air volume.
- Years of top performance . . . due to simple design and sturdy construction.
- Low power cost . . . moderate speeds . . . negligible maintenance.

When planning for additions or replacements, write us regarding your requirements, and ask for Folder R-C 1247.

ROOTS-CONNERSVILLE BLOWER Corp.
911 Columbia Avenue Connersville, Indiana

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

★ *Saves Space*

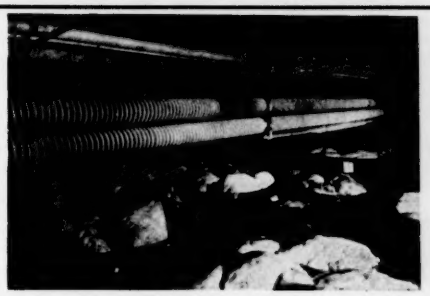
★ *Saves Weight*

★ *Saves Cost*

CAN BE USED WITH ANY REFRIGERANT
SALES AGENCIES SOLICITED

Manufactured by

DETROIT ICE MACHINE COMPANY
2615 Twelfth St., Detroit 16, Mich.



Pickled Meat Cellar
Mathew H. Klein Co., Detroit, Mich.

on ball bearings. All the gears and bearings are of standard make.

The machine is powered by a 3 hp. motor, driving with three V belts. The only chain used in the unit pulls the block of ice through the horizontal saws. All ten saws are protected by guards. Minimum space is required for the unit. It is only 78 inches at its highest point, eight feet long and 34 inches wide, from guard to guard.

Jamison Adds New Plywood Door

EXTENSION of their walk-in line of commercial cooler and freezer plywood doors to include reach-in, track, double, and vestibule models has been announced by the Jamison Cold Storage Door Co., Hagerstown, Md.

New Jamison Series "50" Vestibule Door

The decision to complete the line has been brought about by the unusually fast acceptance of the new monopanel construction. This construction, one piece front and back panels of marine-quality plastic bonded plywood, is said to give as much as four times the strength and rigidity of the usual wood door construction.

The new models make possible the use of plywood refrigeration doors for a variety of applications in the food industry. The track model has been especially built for the meat processing and packing fields to facilitate movement of whole sides of beef, to and from refrigeration. As materials handling becomes more mechanized, double doors solve the problem of moving large truckloads of food between the refrigerating room and the processing room.

The new plywood double doors are available for any size opening, as well as standard openings. It is expected that the vestibule model will be used mainly where there is considerable traffic in and out of the refrigeration room. The swinging doors of the vestibule model automatically close to keep to a minimum the inrush of warm air.

New Sealing Compound

A NEW sealing compound for threaded joints and gasket surfaces, especially designed for refrigeration use, has been introduced by the Highside Chemicals Co., 10 Colfax Avenue, Clifton, N. J. The new product, known as Leak Lock,

Leak Lock forms a tough elastic film of poly-hydroxylated plastic.

has a special poly-hydroxylated plastic base that withstands "Freons" and other refrigerants. This can be demonstrated with carbon tetrachloride which is chemically related to "Freons" and has similar solvent properties.

Leak Lock, it is claimed, prevents leaks of "Freons", methyl chloride, ammonia, sulphur dioxide, isobutane, oil, air and moisture. It sets up fast, thus preventing liquids and gases from pushing through the compound. It remains plastic enough to permit easy disassembly. It forms an elastic, rubbery film that will flex with vibrations and retain a smooth, nonporous skin. It is available through refrigeration wholesalers in nonclogging tubes with screw-eye closures.

Vertical Brine Circulator

VERTICAL brine circulators with gear drive are being furnished to ice plants, and other users of cold brine by the Mixing Equipment Co. Inc. Called the "Lightnin Mixer," the unit is said to require no attention except a change of gear lubricant annually.

Pulling ice from tank equipment with brine circulator.

The manufacturer reports excellent results have been obtained where these vertical brine circulators have been installed to replace horizontal types. At a saving in power they have increased circulation and reduced freezing time.

MANUFACTURERS' NEWS

Armstrong Cork Lays Cornerstone for New Laboratory

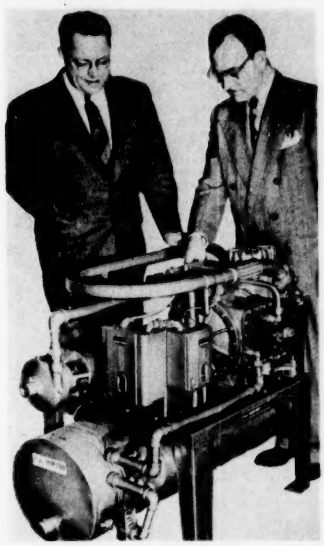
Dr. Vannevar Bush, president of Carnegie Institution and wartime head of the Office of Scientific Research and Development, holds trowel used to cement in place the cornerstone for Armstrong's new laboratories. From left to right are Armstrong executives Edmund Claxton, director of research; C. J. Backstrand, president; Dr. Bush, and H. W. Prentis, Jr., chairman of the board.

Vilter Elects Directors

THE election of O. O. Vogel and Dr. E. B. Tilton as directors of the Vilter Manufacturing Company, Milwaukee, Wis., has been announced by A. A. Silverman, president of Vilter. Mr. Vogel has been with the Vilter Manufacturing Company since 1923. In May, 1949, he was elected vice-president in charge of sales and continues in that capacity. Dr. Tilton, formerly president of Vilter, has been associated with the company as economist and management consultant since he resigned as president in November, 1949.

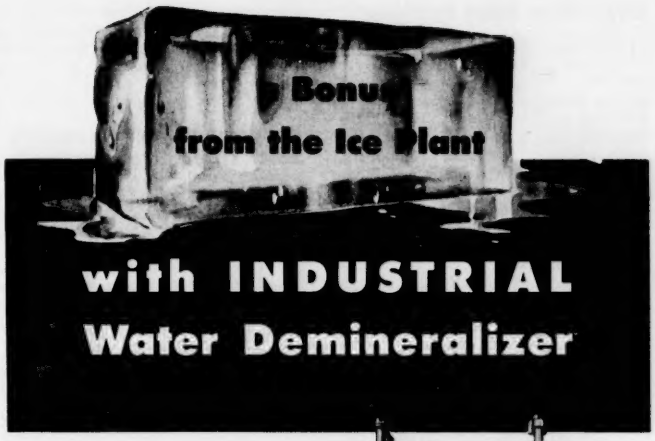
Acme Sales Conference

ALL of Acme's representatives in the North Central and Eastern States convened in Jackson, Mich., on October 16-17. This marks the first sales conference held at Jackson since 1948. The conference consisted of a tour of the plant, viewing the products and manufacturing facilities, together with a series of talks and discussions on the latest developments in design and sales.



Acme Flow-Cold Liquid chiller designed to cool and circulate chilled water for commercial and industrial applications.

Subjects discussed were: field supervision; field operations; expanding markets; new products; the Acme expansion program. Speakers included: K. A. Weatherwax, president; Guy L. Baldwin, vice-president; E. B. Dunphy, A. B. Newton, Carl Millsom, William R. Funk, J. T. Maloney, Louis Russo, Pat Whalen, Henry Smith, Louis Gerber, Duane Merrill and Morris Furnival.



A typical two-bed Industrial Water Demineralizer. Standard models available with capacities up to 1000 gph. Special units of any capacity engineered to requirements.

Here's how it works...

Instead of running ordinary city water into the freezing tanks, it is passed through the Industrial demineralizer where beds of ion-exchange resins remove the dissolved mineral salts—delivering the chemical equivalent of pure water.

With this pure water there are no minerals to deposit in the core—so the whole core-pulling operation is eliminated. Furthermore, the amount of ice which cracks in the cans is appreciably reduced. And the transparency of the whole cake is improved—your customers will notice the difference and like it.

It's easy to find out how to get this big bonus from your ice plant. Send us an analysis of the water you are using, the quantity you need, and at what rate (gallons per hour). We will send you complete information on demineralized water, estimate of costs, performance data, etc. Better look into it right away.

FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog • Humidity

INDUSTRIAL FILTER & PUMP MFG. CO.

5914 Ogden Avenue
Chicago 50, Illinois

RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS

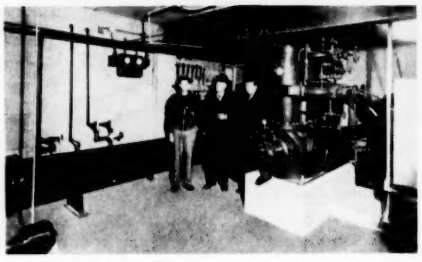
Boyer New Sales Engineer

THE appointment of Roy H. Boyer as sales engineer in the North Central area has been announced by the Manufacturers Sales & Service Corp. of Des Moines, Iowa. This territory includes the States of Missouri, Iowa, Michigan, Minnesota, Wisconsin, Illinois, Indiana and Kentucky. Although new to the Ice Industry, Mr. Boyer has a fine background and wide experience during the many years he has been in the field of heavy equipment. His headquarters will be in Chicago. Manufacturers Sales & Service Corp. is well known to the ice industry as the sole distributing agent for F. B. Dickinson & Co., manufacturers of "Sturdy-Built" refrigerated ice vending stations and outside storage depots.

Wright Chemical Appoints Scott Director of Service

ROBERT D. SCOTT has been appointed director of services of Wright Chemical Corporation, Chicago, specialists in water conditioning. The announcement by President V. L. Marle says he will supervise the activities of the Wright Service department and analytical laboratory. A graduate chemical engineer from Kansas State College, Mr. Scott has been associated in the water-conditioning field for many years, the past four as assistant to the Wright Research Director, N. A. Bailey. Former positions were with D. W. Haering & Co., and Infilco, Inc.

Another CP Engineered Rink—



DIXIE ARENA
Dixie, Ontario

Pictured by the CP Ammonia Compressor from left to right are: Earl Howard, Manager, and L. Pallette, President of Dixie Arena Co., and H.W. Nellist, in charge of Creamery Package Canadian operations.

CREAMERY PACKAGE is proud to have helped engineer in complete detail the recently opened modern DIXIE ARENA at Dixie, Ontario, operated by the Dixie Arena Co.

Ice area is 185' by 85' and required 43,000 ft. of piping for the brine. The CP refrigeration system installed includes a 9 x 9 CP Ammonia Compressor with automatic controls, a Shell and Tube Brine Cooler, an Evaporative Condenser, and one 900 gal. per minute brine pump.

Whether you are planning a rink for public skating, hockey or curling, CP Refrigeration Engineers will be glad to work with you.

THE Creamery Package MFG. COMPANY

General and Export Offices: 1243 W. Washington Blvd., Chicago 7, Illinois

Atlanta • Boston • Buffalo • Chicago • Dallas • Denver • Houston • Kansas City, Mo. • Los Angeles • Minneapolis • Nashville • New York • Omaha • Philadelphia • Portland, Ore. • St. Louis • Salt Lake City • San Francisco • Seattle • Toledo, Ohio • Waterloo, Ia.

CREAMERY PACKAGE MFG. CO. OF CANADA, LTD.
267 King St., West, Toronto 2, Ontario

THE CREAMERY PACKAGE MFG. COMPANY, LTD.
Avery House, Clerkenwell Green, London, England

CATALOGS and BULLETINS

Bulletin on Multipass Ammonia Condenser

AN illustrated description of Frick multipass ammonia condensers, type MS is given in a recent Ice & Frost Bulletin, published by Frick Co., Waynesboro, Pa. Among other advantages this type of condenser offers a high resistance to corrosion because of its closed design. It is especially desirable in regions where sulphur fumes, carried in the air from the burning of coal make corrosion due to acids a serious danger. Other advantages are listed and details of construction are given.

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, and March 3, 1933, of ICE AND REFRIGERATION, published monthly at 435 North Waller Ave., Chicago 44, Ill., for October 1950.

State of Illinois, Cook County, ss.: — Before me a Notary Public, in and for the State and County aforesaid, personally appeared H. T. McDermott, who, having been duly sworn according to law, deposes and says that he is the Editor and Publisher of ICE AND REFRIGERATION, and that the following is to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, and March 3, 1933, embodied in section 433 Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, Nickerson & Collins Company, Chicago, Ill.; Editor, H. T. McDermott, Elmhurst, Ill.; Managing Editor, E. R. Curry, Chicago, Ill.; Business Manager, L. R. Townsley, Chicago, Ill.

2. That the owners are: Nickerson & Collins Co., Chicago, Ill.; H. T. McDermott, Elmhurst, Ill.; H. T. Curtis, Chicago, Ill.; L. R. Townsley, Chicago, Ill.

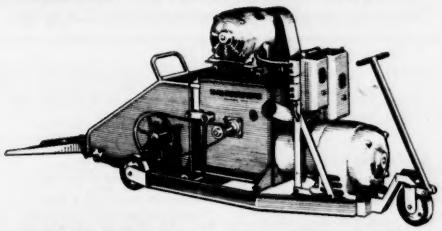
3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: There are no bondholders, mortgagees, or other security holders.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, as they appear upon the books of the company but also in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which the stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) H. T. McDermott,
Editor and Publisher.

Sworn and subscribed before me this 25th day of September, 1950. Helen G. Smith, notary public. [Seal.] (My commission expires June 24, 1952).

CRUSHES and DELIVERS
1800 lbs. of ICE per MINUTE



TRI-PAK ICE CRUSHER-SLINGER
(ELECTRIC OR GASOLINE POWERED)

You can ice a load in a matter of minutes with the Tri-Pak Crusher-Slinger because it's the one machine that has the *instant capacity* to produce as much crushed ice as you need, *as fast as you need it!*

With welded steel construction and heavy "X" type frame, the Tri-Pak Crusher-Slinger is *built to take it*, year after year. This portable unit has rubber-tired, ballbearing suspension, making it easy to move. The flexible slinger outlet can be rotated and locked in any position for delivery of crushed ice through rubber or metal hose attachments.

Tri-Pak individual ice crushers, ice elevators, ice conveyors, and icing chutes, slide gates, trolley and accessories can be quickly built to your specifications. For complete information, phone or write today.

TRI-PAK Machinery SERVICE INC.
HARLINGEN, TEXAS
Phone 703

Others are making money!
ARE YOU?

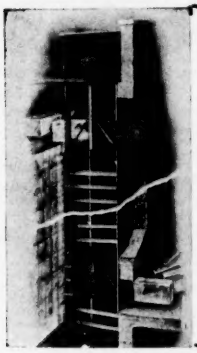
Please Ice Customers. Keep them With Extra fine Long Lasting PICKS

Every plant and ice station should have a PICKWELL vendor.

10c mechanism		15c mechanism	
1—Only	$39.50 ea.	1—only	$44.50 ea.
2—9	31.00 ea.	2—9	42.00 ea.

Write for Details

UNITED ICE SUPPLY CO.
55 BEVERLY BOSTON 14, MASS.



CEMCO
Double Gig Ice Hoist
Fast - Sturdy - Dependable -
Send for details

THE CAPITAL ELEVATOR & MFG. CO.
424 W. Town St.
Columbus 8, Ohio

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ICE DEALERS SUPPLIES

Only the Highest Quality Merchandise and efficient service necessary for the proper and profitable operation of your business. Write for our 1950 catalog.

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Reports, Appraisals and Management

VIVIAN SERV-ICE TRADE MARK REG. U.S. PAT. OFF. Products
ICE TOOLS AND SUPPLIES

WE CONTINUE YEAR AFTER YEAR
to make the kind of Ice Picks that will give YOUR customers satisfaction and build up GOOD WILL FOR YOU.

PRICE UPON REQUEST

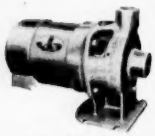
VIVIAN MANUFACTURING CO. 4132-38 Folsom Ave., St. Louis 10, Mo.

Small Capacity • Medium Duty
SIDE SUCTION PUMPS

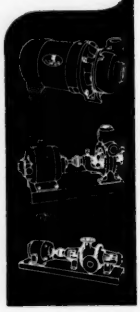
Close-Coupled • **Flexible Coupling** • **Belt Drive**

CAPS 5 to 75 G.P.M. — HEADS 0 to 100 ft.

Ideal as part of Equipment Manufacturer's product, such as, air conditioning units, cooling towers, evaporator coolers, milk coolers, hot water circulators, etc. — and general service. Speeds 1750 to 3500 R.P.M.



Type JMC Aurora Close-Coupled Pump



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AURORA PUMP COMPANY

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ESTABLISHED 1880
Continuous Welded Pipe Coils of Any Metal, Size or Design
PHILADELPHIA PIPE BENDING CO.
FIFTH STREET & N. P. R. R.
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THE BUYERS

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Vogt Machine Co., Henry, Louisville, Ky.

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Ice Plant Equipment Co., Inc. Philadelphia, Pa.

AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.
Refrigeration Engineering, Inc. Los Angeles, Calif.

AIR PURIFYING EQUIPMENT
General Ozone Corp., Chicago, Ill.

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Voss, Inc., J. H. H., New York, N.Y.

AMMONIA COMPRESSORS
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Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
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Phillips & Co., H. A., Chicago, Ill.
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du Pont de Nemours & Co., Inc., E. I., Polychemicals Dept., Wilmington, Del.

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Ice Plant Equipment Co., Inc., Philadelphia, Pa.

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Frick Co., Waynesboro, Pa.
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Kehoe Machinery Co., Inc., R. F., Ridgefield Park, N. J.
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Pittsburgh Pipe Coil & Bending Co.,
Rempe Company, Chicago, Ill.
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Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

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Union Bag & Paper Co., New York, N. Y.

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BOILER TUBES
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BRINE SPRAY COOLING

Acme Industries, Inc., Jackson, Mich.
Frick Co., Waynesboro, Pa.

BRINE TREATMENT

Chemical Solvent Co., Birmingham, Ala.

CAN DUMPS

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Byers Co., A. M., Pittsburgh, Pa.
Chicago Nipple Mfg. Co., Chicago, Ill.
Creamery Package Mfg. Co., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.

COLD STORAGE CONSTRUCTION

Armstrong Cork Co., Lancaster, Pa.
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE DOORS

Butcher Boy Cold Storage Door Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Stge. Door Co., Hagerstown, Md.

COMPRESSOR VALVE PLATES & DISCS

Voss, Inc., J. H. H., New York, N. Y.

COMPRESSORS

(See Ice Making and Refrigerating Machinery)
(See Air Compressors)

CONDENSERS

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Creamery Package Mfg. Co., Chicago, Ill.
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Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

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Ophuls & Associates, Fred, New York, N. Y.

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Gifford-Wood Co., Hudson, N. Y.

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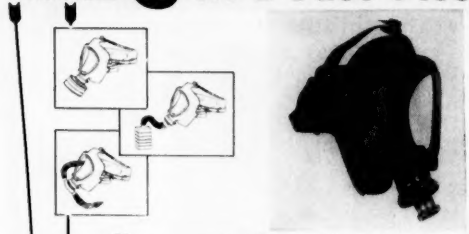

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THE BUYERS

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Gifford-Wood Co., Hudson, N. Y.

ENGINEERS AND ARCHITECTS
(See Architects and Engineers)

ENGINES
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Niagara Blower Co., New York, N.Y.
Refrigeration Engineering, Inc., Los Angeles, Calif.

EVAPORATORS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N.Y.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Vogt Machine Co., Henry, Louisville, Ky.

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Armstrong Cork Co., Lancaster, Pa.

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FILTERS, WATER
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Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

FILTRATION EQUIPMENT
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Rempe Company, Chicago, Ill.

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Henry Valve Co., Chicago, Ill.
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Howe Ice Machine Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Union Bag & Paper Corp., New York, N. Y.

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United Ice & Oil Supply Co., Boston, Mass.
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Gifford-Wood Co., Hudson, N. Y.

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Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
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National Pipe Bending Co., New Haven, Conn.

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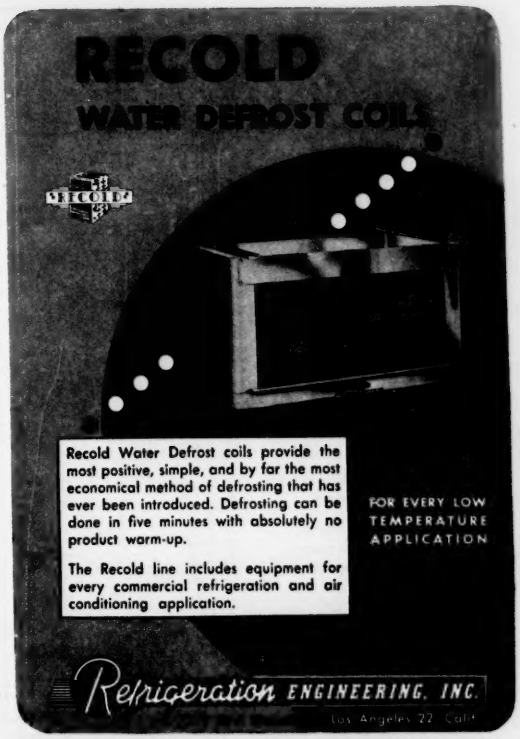
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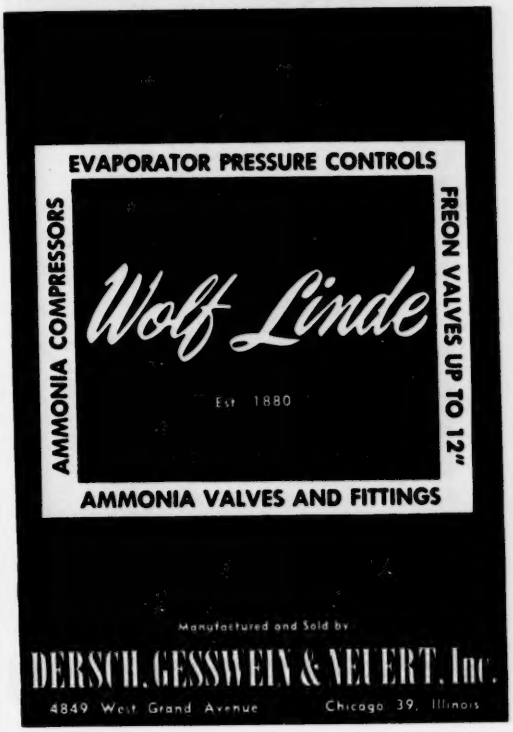

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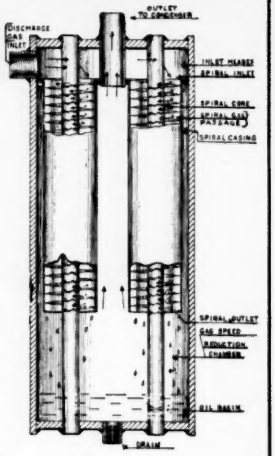

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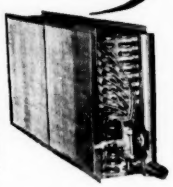

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THE BUYERS

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Acme Protection Equipment Co., Chicago, Ill.

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Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Rex Engineering & Sales Co., Oklahoma City, Okla.

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Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

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Chicago Nipple Mfg. Co., Chicago, Ill.
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Rempe Company, Chicago, Ill.
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Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
Frick Company, Waynesboro, Pa.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Pittsburg Pipe Coil & Bending Co., Philadelphia, Pa.
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Roots-Connersville Blower Corp., Connersville, Ind.

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Deming Co., The, Salem, Ohio
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
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Roots-Connersville Blower Corp., Connersville, Ind.

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Frick Company, Waynesboro, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.

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Ice Plant Equipment Co., Inc., Philadelphia, Pa.
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Ice Plant quipment Co., Inc., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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S & S Vending Machine Co., San Jose, Calif.

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Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Vivian Mfg. Co., St. Louis, Mo.

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Ice Plant Equipment Co., Inc., Philadelphia, Pa.

SPRAY PONDS
Frick Company, Waynesboro, Pa.

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National Pipe Bending Co., New Haven, Conn.

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Vogt Machine Co., Henry, Louisville, Ky.

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Gifford-Wood Co., Hudson, N. Y.

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Managing chain of midwest ice mfg. plants with cold storage facilities. Owners, not active, will share earnings with executive who understands and can develop all phases of ice industry for maximum returns and growth.

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RATES: $3.50 for 50 words or less; 60c for each additional 10 words or fraction thereof; 75c per line for bold face headings; $6.00 per inch for line listings.

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WANTED—Ice Company Executive; see our display ad on page 77 of this issue.

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WANTED—Complete used Frick, York 300 lb. can ice plants 10 to 40 tons, 220-60-3 drive low pressure air, also high speed Frick, York ammonia compressors 4x4 to 10x10, shell-tube condensers, receivers, boosters. Only modern equipment. Give year installed, serial numbers, detailed description, price F.O.B. Prefer Illinois and West. No dealers. Address Box SP-17, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

WILL LEASE—To responsible firm or individuals, our 60 ton daily capacity ice plant, now in operation. All facilities, such as our own R.R. trackage into our property, and large brick constructed storage, that can be converted to cold storage or for ice cream manufacturing. Also 25,000 gallons underground storage tanks, suited for oil or gasoline, and large filling station in front of property. Located on the most prominent avenue in Midsouthern city of over 400,000 population, fronting 200 feet on avenue with depth of 600 feet. Full information on request if interested. Write or wire Box NV-5, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

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FOR SALE—18 ton ice plant. All equipment in excellent condition. New blower type condenser. One new 72 can tank; two others in good condition. 216 cans. Large industrial, oil and farming area. Owner needs rest. Inspection invited. Write for appointment. Address P.O. Box 486, Stroud, Okla.

FOR SALE—at sacrifice—two 30 ton York ice plants; just shut down; everything in excellent condition. Must vacate building. For further information, please write or wire Box 642, Central Y.M.C.A., Reed & Washington Sts., Reading, Pa.

FOR SALE—Modern 5 ton ice plant in center of new oil field; 140 miles from railroad or competition. Price $15,000 including 2 acres plat. Terms to qualified operator. Address Box OT-18, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—25 ton ice plant in dairy and resort district. Machinery and equipment in excellent condition. Diesel driven. Located on state highway on outskirts of county seat. Includes growing coal business. Opportunity for increasing business excellent. Owner in poor health. For further details address Box OT-3, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—458 can ice plant. Located in South; on two national hi-ways, main street of city with population of 30,000. Natural gas driven; 4 compressors, 2—8x8 Yorks, 1—6¼x6¼ Baker, 1—4x4 Frick. Machinery in very good condition. Total cost for gas, water and oil less than 50c per ton, over the past three years. Other competition very agreeable. Owner in poor health. Address Box OT-9, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—ICE PLANTS & EQUIPMENT

1—75 ton York ice plant, Diesel driven, brine coolers.
1—60 ton York ice plant, electric driven, trunk coil.
1—30 ton York ice plant, electric driven, trunk coil.
1—15 ton ice plant, Diesel driven.

AMMONIA COMPRESSORS

1—16x18 York with synchronous motor.
1—10x10 York, 360 r.p.m. FF lubrication.
1—10x10 Yorks 225 r.p.m. FF lubrication.
1—10x10 York 200 r.p.m.
1—10x10 Frick 300 r.p.m. with 125 h.p. motor.
1—9x9 Frick 250 r.p.m. FF lubrication.
1—9x9 York 200 r.p.m.
1—8x8 York 360 r.p.m. FF lubrication
1—8x8 Frick 360 r.p.m. FF lubrication, capacity control valves.
2—8x8 Yorks 200 r.p.m.
1—7½x7½ York 200 r.p.m.
1—6x6 York 360 r.p.m. FF lubrication
1—5x5 York self-contained unit.
1—4x4 York self-contained unit.
Assorted brine coolers, condensers, receivers.

B & E REFRIGERATING CO.
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Phone: Mitchell 3-7790 Cable Address "BERECO"

COMPLETE 20 TON ICE PLANT

One of the most modern and completely equipped plants in the South. Brick and tile building; 214 block storage room with steel re-inforcements and cork insulation. Designed and built to get the highest degree of efficiency with a minimum of overhead; all on the same floor level. Tanks, compressors, etc., are in full view from office and platform. Gauge board located in office. Machinery and equipment as follows:

1—7½x7½ Vilter vertical twin cylinder compressor, with V-belt drive.
1—6x6 Frick vertical twin cylinder compressor with flat belt drive.
1—5x5 Frick vertical twin cylinder compressor with flat belt drive.
Each compressor is of the enclosed type, individually equipped with Mercoid Safety cutout valves.
2—Accumulators.
1—Ammonia receiver.
1—10"x12'0" long, vertical open end shell and tube condenser.
1—16"x19'0" long horizontal shell and tube condenser.
Both equipped with safety cut off valves.
Marley spray tower cooling system, fed by 2 Fairbanks-Morse water pumps, 2" and 3" discharge respectively; used singly or as a unit, according to temperature.
1—Ice tank 10 rows x 12 cans wide, 11x22x50.
1—Ice tank 12 rows x 12 cans wide, 11x22x50.
Each tank can be operated singly or as one unit. Total 264 cans. Tanks equipped with Martocello and Vilter air systems. Both tanks and storage are equipped with Alco Automatic ammonia control valves.
1—U. S. Hoffman air blower.
1—Vertical and 1 horizontal agitator.
1—Detroit electric hoist—one can lift.

Located in the midst of a large, thickly populated colored section and industrial area. All ice is sold retail and wholesale at platform (wholesale to peddlers). Have no delivery or trucks. Selling total plant capacity 4 to 5 months of the year; buy additional ice at peak of season, and average ½ to 2/3 of capacity remainder of year. All equipment installed so as to operate according to tonnage needed, at various seasons; as demand increases additional compressors and auxiliary equipment are put in operation.

This plant and property is clear, no mortgages or indebtedness whatever. Appraisal value $50,000; will sell for $30,000 cash as I want to retire.

Mrs. Annie M. Kelly, 1608 - 22nd Ave., Birmingham 4, Ala.

USED MACHINERY—wanted & for sale

FOR SALE—A large quantity of used 1¼" ammonia hardening room and cold storage coils. If interested write for prices. Address Box NV-7, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—Brand new latest type ammonia compressors. One 8"x8" Frick, two 5"x5" Worthingtons, one 5½"x5½" Vilter, all with V belt drives, also new 60 h.p. motor. All just as received from the factories but at lower prices. Address Box SP-3, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—One Fairbanks-Morse 40 h.p. Diesel type V.A. connected by V belts to 25 KW generator; one York 9x9 ice machine with forced feed lubrication; one Fairbanks-Morse deep well pump; several DC generators, motors, belts, line shaft and pulleys. Also refrigerators, Bohn, Coolerators, etc. Cheap. Community Ice Co., 6100 Belair Rd., Baltimore 6, Md.

FOR SALE—Worthington 14"x10"x14" horizontal double acting duplex 2 stage ammonia compressor with 300 h.p. synchronous motor. York, Arctic 13x18 horizontal with 333 h.p. synchronous motor; both units complete with exciters, panels and controls. Bargain. Frick 10x10, York 9x9; ice tongs; 400-lb. ice cans. Gordon Equipment Co., 6530 W. Jefferson Ave., Detroit 17, Mich.

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Bought and Sold
New and Rebuilt

ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.

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FOR SALE—One horizontal multi-pass shell and tube brine cooler of approximately 30 tons capacity, recently retubed and in good condition. Address Box NV-8, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—A number of 9x9, 6x6, 5x5 and smaller sizes in standard and self contained units. Shell & tube condensers and brine coolers, ammonia receivers, oil traps, agitators, blowers, coils, new and rebuilt fittings, oil engines, generators, motors, Parke, Pettegrew & Son Co., 370 W. Broad St., Columbus 8, Ohio.

FOR SALE—New Zenith portable ice-manufacturing machine capable of making twenty 300-lb. cakes of ice each 24 hours. 10 h.p. compressors mounted on platform with heavy, insulated box. Complete with cans, hoist, can-lifter and track, cuber, crusher and Refinite de-ionizers, ready for installation. For price and other terms contact Charles M. Bump, Trustee, 505 Central National Bldg., Des Moines, Ia.

FOR SALE—One 6x6, one 6½x6½, one 7½x7½ high speed York compressors. Two 25 ton horizontal shell & tube condensers. 3x3, 4x4, 5x5, 6x6, 7½x7½, 8x8 and 9x9 York splash lubrication compressors One 4x4 and one 3x3 Frick self-contained units. 5 Acme Freon suspended type blower units. Write Edwin Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—One 6¾"x5" V/W York ammonia booster compressor 8 cylinder V-belt drive complete with base, including 440 volt A.C. motor and 36"x 12' long D.E. gas and liquor cooler plus valves. This equipment is new and has never been installed. If interested contact W. A. Moore, General Manager, New Orleans Cold Storage & Warehouse Co. Ltd., 305 Gaiennie St., New Orleans, La.

COLD STORAGE EQUIPMENT

First-class condition; Dallas plant converting to dry storage. Frick compressors, 10x10, 9x9, 6x6; Bruce 180 & 165 H.P. engines. 125 KVA AC generators, etc. Catalogue on request.

A A A IRON & METAL CO.
2401 Canton Dallas, Texas

FOR SALE — ICE PLANTS AND EQUIPMENT

25- 40- 50-Ton Ice Plants
1—10"x10" York ammonia compressor direct connected to 60 H.P. synchronous motor 200 R.P.M.
1—10"x10" York ammonia compressor direct connected to 100 H.P. synchronous motor 200 R.P.M.
1—9"x9" ammonia compressor direct connected to 50 H.P. synchronous motor 200 R.P.M.
1—10"x10" York ammonia compressor 200 R.P.M.
1—10"x10" Duplex Worthington Carbondale High Speed Compressor direct connected to 250 H.P. synchronous motor.
1—6"x6" Voss ammonia compressor.
2—4"x4" H.S. self contained units, York.
1—3"x3" Frick H.S. self contained units.
1—7½"x7½" York ammonia compressor High Speed.
1—25" dia. x 10'0" long 5 pass enclosed type ammonia condensors.
1—Horizontal Shell and Tube Condensors 39½" Dia. x 14'1" long 152—2" tubes 6 pass.
2—Evaporative Condensors.
Assorted sizes electric hoists and cranes ranging from 2 to 6 ton capacity.
2—Gifford & Wood Tiering Machines, 1—three and 1—four tier.
4—Gifford & Wood Creasey Ice Crushers, Various sizes.
3—Scoring Machines Gifford Wood & Perfection.
1—Euclid Crane, 6 ton capacity.
2000—Ice Cans various sizes.
1—Gifford & Wood 300# Ice Cuber.
Brine coolers, double pipe 2" and 2" horizontal brine coolers, submerged shell and tube type, 1¼" and 2" ammonia coils, approximately 10,000 feet. Send us your requirements on any equipment you may need.

Enterprise Equipment Corporation
77-79 Alexander St., Yonkers, N. Y.
Phone: Yonkers 8-8118-9
Cable Address: ENEQCO

USED ICE MACHINES AND EQUIPMENT

All Used Equipment Is Reconditioned In Our Modern Machine Shop

THIS IS ONLY A PARTIAL LIST-WRITE ABOUT ANY REQUIREMENTS WHICH YOU HAVE

WE ARE BUYING ADDITIONAL EQUIPMENT ALL OF THE TIME

Compressors With or Without Motors

	Item No.
1—4x4 York, 300 RPM	16
6—6x6 York's, 200 RPM	20
1—6x6 Frick, 257 RPM	21
2—6x6 York's, 400 RPM, forced-feed lubrication	25
2—6½x6½ Arctics, 350 RPM, forced feed lub.	30
1—7¼x7¼ Baker, 350 RPM, forced feed lubrication	35
1—7x7 Frick, 200 RPM	40
1—7½x7½ York, 200 RPM	51
2—7½x7½ Yorks, 350 RPM, forced-feed lubrication	54
1—8x8 Frick, 400 RPM forced feed lub., V-belt wheel	57
1—8x8 York, 400 RPM, forced feed lub., V-belt wheel	58
1—9x9 Arctic, 300 RPM, forced feed lub.	62
1—9x9 York, 200 RPM	71
1—9x9 Worthington, 325 RPM, forced feed lub.	72
1—10x10 De La Vergne, 360 RPM, forced feed lub.	73
1—10x10 York, 257 RPM, forced feed lub.	80
1—10x10 Carbondale, 100 HP synch. motor, 350 RPM	81
3—10x10 York's, 225 RPM, semi-forced feed lub.	82
1—11x13 York, 164 RPM, forced feed lub.	90
2—12x12 Frick, direct conn. 150 HP synch. motor	98

Diesel Driven and Diesel Engines

1—8x8 York—Direct connected to 50 H.P. Fairbanks-Morse at 257 R.P.M. 210

Steam Driven

1—8x8 Vertical York, 300 R.P.M. direct connected 327

Pipe

10,000 feet wrought Iron pipe—2"—like new 451

Complete Ice Plants

	Item No.
1—15-ton electric driven plant	630
1—600 Can Trunk Coil Type—York Plant, Brand New Tank. *Complete with 10 Can Grids. This plant is equal to new*	631
Brand New 8 to 10-ton Clear Ice-Making Plants—110 Cans—Electric or Diesel Drive—2 Can Pull	632
1—*247 Can, 22-ton ice plants, like new*	632A
1—35-38 ton New Clear Ice Making Plants	635
1—150 Ton Multi lift—1622 Can Plant	636
1—702 Can Plant—9 Can Pull	637
1—920 Can Plant—12 Can Pull	638
1—150 Ton Ice Plant—2 Tank	660

Self-Contained Units

3—4x4 York & Fricks	742
1—5x5 York—390 R.P.M.	743
1—4½x5 Lipman—360 R.P.M.	744
1—3x3 Worthington	748
1—5x5 Frick—Forced Feed—400 R.P.M. Latest Type	758

Brine Coolers

1—34x10—100—2	802
1—48"x16'—130—2" tubes	808

Condensers

3—100 ton shell and tube condensers retubed	919
1—125-ton, Vertical Shell & Tube, 196 2" tubes	921
1—120 ton, 216—2" retubed Vertical Shell & Tube	922
2—20 ton Horizontal—retubed	924

Ice Cans

150—11½"x22½"x44"—cap refinished in zinc

500—11"x22"x47"—ice cans

2000 Cans—Like new—11x22x47 950

NEW EQUIPMENT FOR IMMEDIATE DELIVERY

Compressors With or Without Motors

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3x3 to 5 x 5—390 R.P.M.	1001
6x6 to 10x10—390 R.P.M.	1002
3x3 to 5 x 5—Self-contained units, complete	1003
5x5—Self contained—15 H.P. motor—V Belt	1004

Ammonia Condensers

4—12¾x12 Horizontal—36—1¼" tubes	1020
2—30x14 Vertical 109—2" tubes	1021
1—16"x10"x10' Shell and Tube Condenser, 60 1¼" tubes	1022

Ice Cans

50—100 lb. cans—15½"x8"x31"	1041
40—50 lb. cans—6"x12"x26"	1042

Ammonia Valves and Fittings

	Item No.
⅜" to ¾"—Screwed Expansion Valves	1050
½" to 2"—Screwed Globe Valves	1051
1" to 6"—Square Flanged Globe Valves	1052
Check Valves	1053
Relief Valves	1054
Strainers	1055
Steel & Malleable Fittings	1056
Extra heavy Ammonia Nipples	1057

Used Ice Cubers

1—300 lb. Uline fully automatic Cuber	501
1—50 lb. F & E Safety Cuber	502

Ammonia Guages, Ammonia Receivers, Ice Crushers, Agitators, and Receivers and Oil Separators.

EASTERN REPRESENTATIVES OF PENGUIN AUTOMATIC ICE VENDING STATIONS

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TANK TOPS • LIDS • WALLS
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KEEP THEM CLEANER . . .

They'll Even Last Longer When Properly Painted!

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GREY PAINT

Is Made Especially For Ice Plant Service

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CSCO Can, Coil and Condenser Coating is a Black Phenolithic Compound . . .

Excellent for coating ice cans above or below brine levels. Also condensers and all other surfaces immersed in either brine or water or exposed to the atmosphere.

PACKAGED IN ALL SIZE CONTAINERS

CHEMICAL SOLVENT COMPANY

3005—16th Street North Birmingham, Ala

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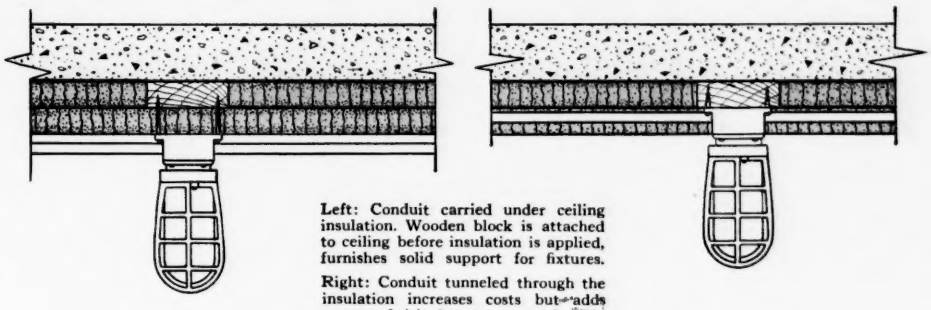


Left: Conduit carried under ceiling insulation. Wooden block is attached to ceiling before insulation is applied, furnishes solid support for fixtures.

Right: Conduit tunneled through the insulation increases costs but adds to neat finished appearance of room.

We have been asked . . .

"HOW DO I HANG ELECTRICAL FIXTURES FROM A CORK CEILING?"

"I am planning to build a large freezer room, to be insulated with 6" of corkboard," writes a man about to enter the frozen food distribution business. "I have heard that dropping outlets through the ceiling reduces the efficiency of the insulation. Is this true, and if it is, how do I hang electrical fixtures from a cork ceiling?"

HERE'S THE ANSWER:

Dropping electrical outlets through a freezer room ceiling violates a cardinal principle of cold room construction; that is, the insulation envelope should be broken only at a minimum number of places. Metal conduits are good conductors of heat and warm air. Moisture in the air flowing into the room through the break made by the conduit will condense, turning to ice in the surrounding insulation, and on the outer surfaces of electrical fixtures. The same thing happens inside the conduit. Over the years, this condensation and freezing is bound to have a damaging effect on both the insulation and the electrical wiring.

Freezing in and around conduits and fixtures can be avoided by bringing all electrical wiring in through one conduit, sealed into the wall. Warm air can be kept from flowing through the conduit with a special sealing condulet outside the wall. In the room, leads are distributed under the ceiling. The problem of holding the fixtures to the cork ceiling is solved by the use of wooden blocks, fastened to the ceiling in the first layer of insulation. Blocks should be at least 6" x 6" and as thick as the first layer of insulation. When the second layer of insulation is applied, the location of the blocks can be indicated with chalk. The electrician can then drive lag screws into the wooden blocks to support the electrical fixtures.

This problem is not difficult, but if ignored can cause trouble on the job. Like so many aspects of low-temperature insulated construction, the best electrical wiring system can be assured by careful planning before the job begins. Armstrong engineers will gladly help you plan your next low-temperature insulation work.

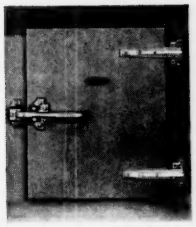
SEND US YOUR QUESTIONS: If you have any questions on the construction of low-temperature facilities, please do not hesitate to write to us. We'll do our best to give you a practical answer. Just address a letter or post card to Armstrong Cork Company, 4511 Concord St., Lancaster, Pa.

ARMSTRONG'S INDUSTRIAL INSULATIONS

NEW SERIES "50"

"MONOPANEL" Cold Storage Door

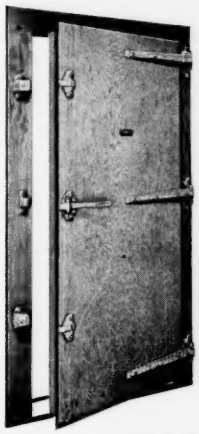
ALL STYLES NOW AVAILABLE



REACH-IN

VESTIBULE

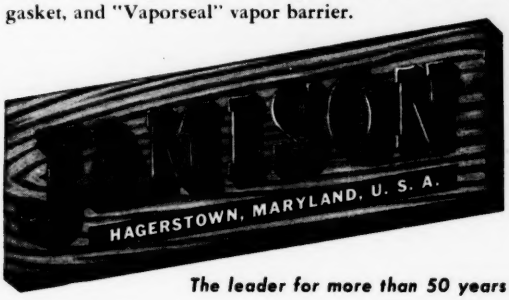
TRACK



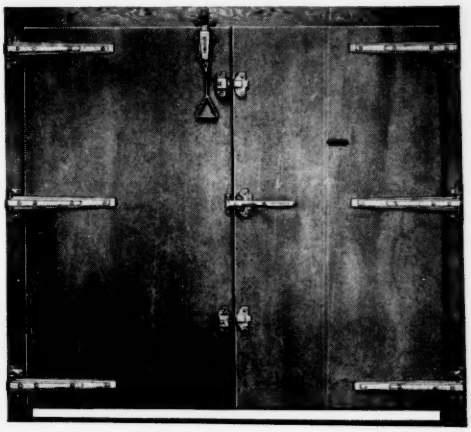
WALK-IN

The quick acceptance of the Series "50" cold storage door with "Monopanel" construction now makes it possible to offer this door in all standard types.

People who use and specify cold storage doors have recognized the advantages of "Monopanel" construction with plastic bonded marine plywood for greater rigidity, smooth, sanitary surface and unbroken insulation. Other important features that contribute to the popularity of the Series "50" Door include the heavy duty, adjustable Jamison hardware—E-Z Open Two-Point Fasteners and Adjustoflex Hinges—the Lo-Temp Gasket, the "Sillseal" gasket, and "Vaporseal" vapor barrier.



The leader for more than 50 years



DOUBLE

Before you buy your next cold storage doors, be sure you have full information on the Series "50". Write for Catalog.

JAMISON COLD STORAGE DOOR CO. • HAGERSTOWN, MD. • U. S. A.